Issue 82 • 2 June 1990 • 58p

WIN £600 Worth of Prizes only in the EXPRESS SUMMER GIVE-AWAY Page 58

NEW COMPUTER EXPRESS

BRITAIN'S BIGGEST SELLING COMPUTER WEEKLY

AMIGA

- Fighter Bomber extra
- Pro-24 update
- Skidz put to the test

ST

- Hard disk price cuts
- ProShare-ST review
- Projectyle on trial

PC

- PC Tools evaluated
- Hypercard gameplay
- Colour laptops

ARCHIMEDES

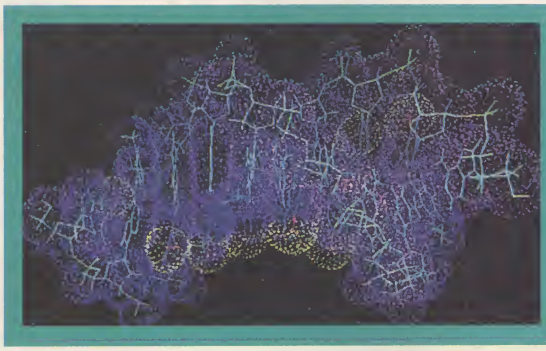
- Spectrum emulator!
- Fireball II arrives

CPC

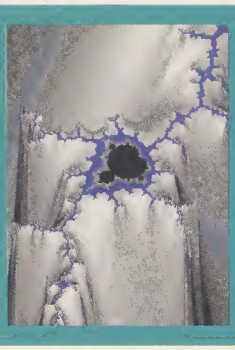
- Astro Marine Corps

Specialist Columns for: BBC•C64•MSX•PCW•PD QL•SAM•SPECTRUM•XE

BARGAINS! Thousands to be found in SHOPPING EXPRESS



Modern three-dimensional computing can model anything from a molecule to a motor car. Express visits the cutting edge of 3D page 46



Mandel-Mountain for the Amiga – it's 3D, it's PD, so it's virtually free! page 14

JAPAN'S CD AMIGA REVEALED

Is the Sanyo CD-X Viewer the prototype for CBM's new baby? page 3

ULTIMATE CONSOLE ARRIVES!

But would you pay £200 for a game? pages 2 and 48

STARTING ON THE RIGHT LINES Beginners guide to comms page 52

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Games for hottest new machine come in at £200

NEO-GEO CONSOLE ON SALE IN BRITAIN

Unofficial supplies of the Neo-Geo, Japan's latest console, are beginning to trickle into Britain through a variety of retail outlets at prices upwards of £400, with games costing around £200 each!

The Neo-Geo contains the same processor as an Amiga, ST or Macintosh – the Motorola 68000 – but running 50 per cent faster, and also has a Z80A dedicated purely to sound functions.

The machine was launched in Japan around five weeks ago, and some sources report initial stocks as having already sold out. It is not due for an official British launch until September, with distribution by Degaulle Marketing.

Degaulle's Luther Degaulle is being coy as to policy and price, restricting himself to the statement that he is "quietly confident" about the launch. It is believed that supplies in the autumn will be limited, with a wider availability in the new year when the software base should be considerably larger than the present six games.

In the meantime, a number of UK outlets have organised unofficial imports, mostly believed to be sourced in Hong Kong, and on a small scale sales are already brisk. Prices are well above Japanese levels (where the machine sells for around £260 and games for around £120) and are likely to alter rapidly as suppliers check each other's prices, jostle and attempt to undercut.

• Just part of a screen from Magician Lord, a 46Mb cartridge game costing £200.

Games fanatics who cannot wait for the anticipated lower-priced official machines and who are feverishly reaching for their wallets are advised to shop around (and keep their eyes on Shopping Express) for the latest prices and details of game availability. Check whether the machine on offer will run at UK mains voltages or whether you will need to buy an additional power supply.

As some, if not all, of the machines reaching Britain are configured for the NTSC television standard, you should also check with your preferred supplier whether their Neo-Geos have been converted for the British PAL TV standard or will only run through an RGB monitor before making your purchase.

• For a full review of the Neo-Geo turn to page 48.

UK stockists

Known suppliers of the Neo-Geo in this country are:

• Supervision Electronics (0602 475151) has stocks at £450, games at £240 or machine-plus-game at £600.

• Telegames (0533 880445) had sold out at press time, but should have fresh stocks by now at £450 with games at £199.95.

• Shekhana (081-889 9412) has stocks at £475 with games at £225, or machine plus both games for £900.

• Cyber-Tech (0453 544582) has no stocks yet, but reckons to be offering machines in the very near future at £399 with games at £199.

CYBERFUNK IN ACTION

• This is a still from the latest video by Coldcut, who have started using Amigas and Archimedes to jazz up their music's visuals. The group have used the computers to make videos for all the tracks on their LP Some Like It Hot *which will be released on tape and CD-Video. Coldcut use an Archie with a Pineapple digitiser and an Amiga with Vidi-Amiga,* Sculpt-Animate 4D *and* Deluxe Paint *to produce fast-moving scenes to match their brand of high energy dance music.*

• Massive multisync monitor from Mitsubishi.

Monster monitor

A massive 29-inch monitor from Mitsubishi is aimed at multimedia applications.

The EUM-2915A will run off PCs, STs, Amigas and Macintoshes, and has detachable stereo speakers for better sound. In a true multimedia environment a wired remote control allows the user to switch from one source to another.

At £2,640 the EUM-2915A may be out of the range of the average pocket, but it should find a niche in the educational market place. More info from Mitsubishi on 0707 276100.

Interactive TV game puts you on the real life football pitch

A novel gaming system which allows TV viewers to interact with live sports transmissions is coming to the UK.

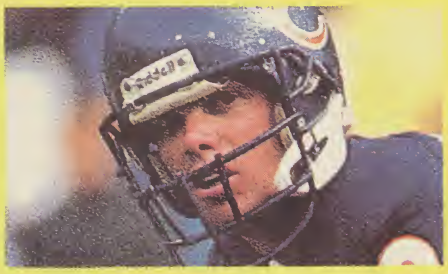
A Californian company, NTN Communications, has licenced its *National Football League* interactive game system to the BBC and the service should be up and running by the autumn.

In the States over 400 restaurants, bars and hotels provide the system free of charge to customers. Up to 20 users can play alongside live football, hockey and baseball games using hand-held, infra-red 'Playmaker' consoles.

Interactivity takes the form of viewers being able to amass points for correctly predicting the outcome of live moves resulting from 'dead-ball' situations. In the *NFL* football game, for instance, viewers guess the direction, length and outcome of subsequent play, punch in their choice on the console and compete against fellow players – even in different cities.

A small monitor next to the TV updates the success of the outcomes predicted by the participants. Winners receive free trips abroad, replica trophies of major competitions and cash prizes.

In Britain, licensee VTV has already signed an agreement with the BBC and Whitbread Breweries to bring the system to pubs up and down the country. Chances are you'll be able to compete in the 1991 FA Cup competition from the comfort of your own local!



• *Sack Jim McMahon directly with* National Football League.

Japanese magazine lifts the lid on Commodore-Sanyo joint venture

SANYO FIRST OFF THE BLOCKS WITH A CD-ROM AMIGA 500?

A combined CD-ROM/Amiga had already been developed in Japan as early as last August, *Express* can reveal.

The CD-X Viewer incorporates a Commodore Amiga A500 and Sanyo CD-ROM unit and is reported by Japanese magazine *PC Engine News* to have had the wholehearted support of Commodore in its manufacture and development.

Photographs in *PCEN* show a unit bearing a remarkable resemblance to an Amiga 2000 with a built-in CD-ROM unit. Indeed, close examination shows the keyboard to be that of an A2000 complete with A-keys signifying Amiga. The normal Amiga badges have simply been replaced by a Sanyo logo. The rear of the unit also features exactly the same I/O ports in the same order as the Amiga 500.

UNEXPECTED

The unexpected emergence of these details has given rise to speculation that Commodore's much-discussed 'Amiga Baby', due to be launched this weekend at the summer Consumer Electronics Show in Chicago, is in fact a combined Commodore–Sanyo project which started life with the CD-X Viewer prototype, built by Century Research.

Ironically, it was after seeing the Amiga at last summer's CES show that Japanese electronics wizards at the Century Research Centre built the CD-X Viewer.

Commodore US claimed no knowledge of the machine and referred *Express* to Commodore International, which said it was unable to comment. Because of international time differences, Commodore Japan had to be contacted by fax and had not responded by the time we went to press.

Surprisingly, Commodore's UK press office appeared to have heard of the machine, but denied that it was based on A500 technology. A PR spokesman believed that the unit was "a development product based on Amiga A3000 technology" and intended as a point-of-sale unit.

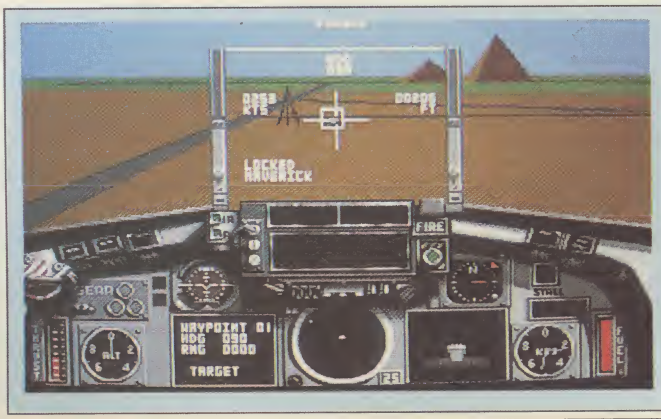
But because the CD-X Viewer uses a 68000 chip, has 512K of RAM and all the screen resolutions and external ports are identical to an A500, it is thought that the point-of-sale machine is in fact another of Commodore's joint development projects with Sanyo for the Japanese market.

Also able to play standard audio CDs, the CD-X Viewer's CD-ROM unit offers 550Mb of data storage, an average access time of half a second and is designed to run conversions of popular arcade games from leading Japanese companies like Taito, Capcom, Sega and Konami. Such Japanese publishers already have the capacity to release CD conversions of games, as the PC Engine also features an add-on CD-ROM drive.

According to the machine's inventor, '–' Nakamura (*sic*): "The Amiga is the world's leading games machine and we want to introduce its many titles to our home market for the first time. We see CD-ROM as the leading medium for the future".

• For full 'Amiga Baby' launch details see next week's *Express*.

• *PC Engine News' report of the prototype CD Amiga.*



Bomb run

Addicts of Activision's *Fighter Bomber* who have killed every enemy to be found will be pleased to hear of an expansion disk for the game.

Fighter Bomber Advanced Mission Disk adds 16 progressively more difficult missions to the original scenario and gives you choices of land and sea missions in a variety of military strike aircraft.

The advanced mission disk must be used in conjunction with the original *Fighter Bomber* disks and will be available for Amiga, ST and PC from July. The price has not yet been set.

• *Left: Fighter Bomber gets more missions.*

Manchester united with European bulletin boards

Manchester goes on line later this year with a £500,000 public bulletin board and local database called The Manchester Host.

The Host will carry local information such as flight times from Manchester Airport and a giant database of general information about the city. An electronic mail facility will be included and it will be self-financing.

Manchester plans to lease 'electronic workspace' to small companies, as well as offering fax and telex services.

As well as being targeted at industry and commerce, individuals will be able to subscribe for around £25 a month.

The Host will be run by Soft Solution, a London-based co-operative that will move north to run it. Soft Solution currently manages the UK base of the Geonet electronic mail system, which has been chosen as the ideal mechanism to carry Manchester's system.

Connection to Geonet will link The Manchester Host to similar systems around Europe, and with systems planned in Holland, West Germany, Spain and Portugal, the wires could be buzzing across the continent.

Some £300,000 of the budget has come from the Government's urban programme with Manchester City Council finding the remainder.

Dave Carter, spokesman for Manchester City Council said: "We hope to have the E-mail up and running in a few months with the rest of the system following."

Manchester City Council is on 061-234 1259.

June ST and Amiga show

The ST and Amiga 16-Bit Computer Fair promises to be an event packed with launches and the organisers are hoping to attract 20,000 plus visitors

New games and programs are promised from Core Design, Psygnosis, Horrorsoft and Soft Stuff, and there will be a live music workshop from The Deeper Domain.

Riverdene PDL will have an ST slide transfer system on sale at the show.

The 16-Bit Computer Fair will be held between June 28 and July 1 at the Royal Horticultural Halls in London.

Save our sphinx

Scientists have placed a computerised weather centre on the Sphinx's back in a bid to learn more about the effects of erosion on the limestone layers of the statue.

The £120,000 solar-powered station transmits incoming data on rainfall, wind direction and speed, humidity and pollutants to a computer a mile away.

The scientists hope that the results will enable them to develop ways to save the statue from erosion.

ST hard disk price cut

The rather strangely-named bbdp Electronics has been appointed official suppliers of the Supra range of hard drives for the ST – and has immediately cut the prices.

The company has been appointed by Frontier Software and will supply drives ranging from 20Mb at £374 to 84Mb at £632.50. Further enquiries to 0383 881768.

Game over...

Killer Leonard Laws was executed in Texas last month – after spending several hours playing Nintendo video games.

Laws, aged 40, was sentenced to die in 1981 after brutally murdering two old people. His last wish was granted in line with Death Row tradition. After a hearty breakfast the murderer asked to be allowed to spend his last hours playing his favourite computer games – before a lethal injection was administered.

Fax service offers comms without the computer

MERCURY FACTS BY FAX SERVICE STARTS

A revolutionary means of gaining 24-hour, seven-day access to on-line information without the need for a computer or teletext TV was unveiled last week by Mercury Communications.

With Faxess, telephone users anywhere in the world can dial up information services and request data to be automatically and immediately faxed to the machine of their choice.

Mercury will act as network providers, with material being charged to users on a per-page basis by the information suppliers, in a similar way to viewdata systems. With UK fax ownership currently topping half a million, the company expects Faxess to receive hundred of thousands of calls a day for news, business, travel and leisure information once the system is fully up and running.

Faxess draws on the new tone-dial telephone technology to enable users to punch in numbers in response to spoken menu options.

• Part of a Faxess fax shown actual size.

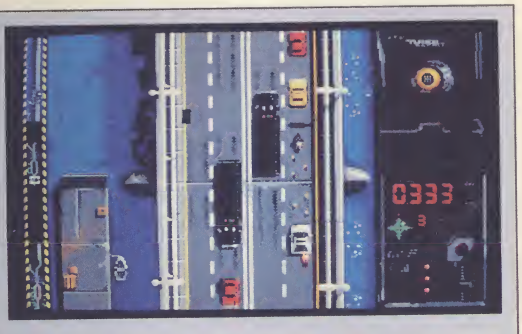
The requested information can take the form of graphs, photos and logos as well as text, and is delivered at a resolution of 200 dots per inch – a quality Mercury claims to be close to the laser output of desktop publishing packages.

Described as a 'world first', the Faxess system consists of an automated switching centre 'staffed' by a female voice, which routes calls to information providers' mainframes where a Mercury unit allows the phone inquirer to interrogate that system.

Mercury claims the device 'can talk to any computer and relational database on the market'. The resulting information is re-routed back to your fax with even the most complex data taking less than two minutes to arrive.

Mercury has yet to reveal the names of companies likely to take up the service but is counting on revenue running into several millions. Reuters, British Rail, airline companies and financial services are those most likely to utilise it first.

If you have a fax you can try out Faxess on 081-419 0330.



• Scenes from Bond's latest epic, taken from an ST.

Bond is back again

The Spy Who Loved Me is the latest in the 'game of the film of the book' series from Domark. This time it's up to Bond to glug around in the amphibious Lotus Esprit while trying to sort out the evil Karl Stromberg with malice aforethought.

In true 007 tradition, it's save the world from evil before time runs out, with a tension-building time limit before New York and Moscow are nuked out of existence. To complete the Bond scenario there's a beautiful Soviet agent with an unpronounceable name.

Available for PC, ST, Amiga, C64, Spectrum and Amstrad from September.

A600 machine will be 1Mb with Workbench 2

NEW AMIGA PLANNED FOR AUTUMN LAUNCH

After the recent launch of the A3000 and imminent launch of a CD-ROM machine, Amiga owners can look forward to yet another release this year.

Scheduled for September is the Amiga A600 – an upgrade to the A500 featuring 1Mb of RAM, the new Enhanced Chip Set and Workbench 2.

While rumours of an A600 have abounded for some time – indeed *Express* first ran the story last July – it's the release of the new Workbench for the A3000 which has begun to firm up speculation. Workbench 2 will be available in September and will run on existing A500s.

Steve Franklin, Commodore's UK boss, is on record as stating that an upgrade path for the A500 is on the cards when at last year's PC Show he told *Express* "We have hopes for something exciting for the middle of next year, something fundamental to the Amiga".

But Commodore is also known to be keen on introducing a new enhanced entry-level Amiga besides the CD machine. The A600 will fulfill that role, and industry sources expect an external CD-ROM drive to be made available so the machine can run the expected avalanche of CD games titles.

• Amiga: base model due for an autumn upgrade.

• Corporately test a SupersPort for free.

Test drive a Zenith PC

From June 6, potential buyers will be able to give any of Zenith Data Systems' portable computers a seven-day free 'test drive'.

As David Dury, the company's general manager, commented: "How many other manufacturers have enough confidence to mount a campaign of this nature? We know our portables are some of the best – we want users to know this too."

The offer is only open to companies with ten or more employees or a business registered for VAT.

Machines available for the 'test drive' are the SupersPort range – the SX (VGA), 286e (VGA), 286 (CGA) – and the MinisPort. There will also be a brand new addition to the range, to be announced on June 6.

The 'test drive' lasts from June 1 to July 31. Call the 24-hour freephone number 0800 800450 for details.

JACK'S BACK

• Bomb Jack, the classic arcade game of yesteryear, has been reissued for the Atari ST and Commodore Amiga at the budget price of £9.99. Encore is putting out the game, which you may remember involves flying around collecting bombs while avoiding strangely-shaped enemies. It will be in the shops on June 20.

Israeli challenge to US giants

After the US refused to export supercomputers to Israel for fear they would be used to design and produce nuclear weapons, Israeli university officials claim that their scientists are developing a system more powerful than anything the US can offer.

US spokeswoman for Technion, Israel's leading high-tech university, confirmed that Israel was looking to the US for funding of the project which will offer an alternative to the supercomputers offered by Cray and IBM. She said: "The writing's on the wall. We have to go it on our own."

Brian Silver, a director of Technion, said that Israel had planned such research anyway but the US's refusal to export state-of-the-art supercomputers had given the project a strong push.

Spate of colour laptop launches

New colour screen techniques for laptops, including thin film technology (TFT), were unveiled at the Tokyo Business Show recently, as colour laptops began to reach the shelves in significant quantities.

NEC produced its most advanced laptop, the PC-9801 T Model F5, which attracted a lot of attention despite costing 1,150,000 yen (over £4,600). Whereas previous laptops have depended on super twist nematic (STN) colour screens, which are darker and less clear than those using traditional cathode ray tube technology, the NEC Model F5 uses a much superior colour liquid crystal and TFT to display eight colours.

It has an Intel 80386SX processor, and its standard 1.6Mb main memory can be expanded to 14.6Mb. There is a 40Mb hard drive with two 3.5-inch floppy drives. The keyboard is detachable from the main unit.

Seiko-Epson also unveiled a colour LCD laptop, the PC-386 LSC. This adopts an original metal insulator metal (MIM) active matrix colour LCD panel which can display 16 colours from a palette of 4,096. This machine is priced at 980,000 yen (just under £4,000) which makes it significantly cheaper than the NEC Model F5.

This machine is also built around an 80386SX and has a standard 640K main memory expandable to 8.6Mb. It has two built-in 3.5-inch floppy drives and both 20Mb and 40Mb hard drives are available as options.

Many observers believe TFT is essential to colour laptop screens and Hitachi demonstrated it on its own AT-compatible laptop, the HL500C. This uses an 80386SX, 1Mb memory and two 3.5-inch floppy drives.

Unlike the other laptops at the show, which are due to be released first in Japan, the HL500C will be aimed at the European market.

The bad news is a price of around 20,000 Deutschmarks (£7,600).

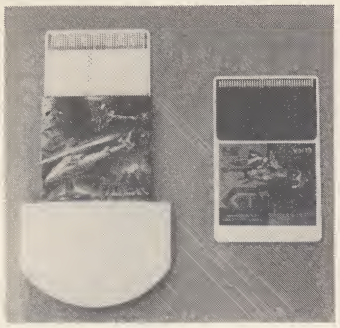
Table service

A hand-held computer that sends a gourmet's order to the kitchen while the waiter is still at the table has been announced by NCR in Chicago.

The 2750 hand-held order system uses a tiny radio transmitter to send the information to the kitchen.

At the end of the meal it can even print the bill.

NCR is promising to ship from next month, but the price could be a little hard to swallow – $10,000 (about £6,100) for the base station, two terminals and a battery charger.



• One of the pirated Nintendo cartridges.

Nintendo set to fight pirates

Nintendo is preparing itself to fight an international battle against cartridge pirates as illegal multiple games cartridges become more common.

Howard Lincoln, Nintendo's senior Vice President, said: "We want to protect consumers for whom Nintendo means quality and value." He added that Nintendo would sue anyone who rents, sells or imports counterfeit Nintendo software.

The most common sort of copy is the multiple game cartridge. If you have or are offered one of these, you can be sure that it is an illegal copy as Nintendo do not make or licence any multiple game cartridges.

• NEC is now buying into CD software.

NEC buys into CD games

NEC, the Japanese computer giant with interests in everything from printers and PCs to the PC Engine, has bought a 15 per cent stake in Cinemaware – the American company with a reputation for advanced CD-ROM games development. NEC manufactures CD-ROM drives.

Cinemaware was responsible for *Defender of the Crown*, one of the very few CD-ROM games available. The company is currently working, with JVC, on *Lords of the Rising Sun*, again on CD-ROM and designed for the PC Engine.

The 15 per cent stake is rumoured to have cost NEC over $1 million, but the chance to get in 'on the ground floor' is presumed to be worth it. Bob Jacob of Cinemaware commented that the deal with NEC gave his company an entry into "the largest captive market for CD-ROM in the world, which is NEC in Japan".

Satellite beams down your location to your car

NAVIGATION SYSTEM FITS ON DASHBOARD

Within a few weeks Japanese motorists will be finding their way around with a navigation system based on American military satellites.

The system was jointly developed by an American firm called Trimble and Pioneer – the Japanese electronics company. The device displays a map on a colour screen on the dashboard which pinpoints the car's position.

It relies on the US Government's Global Positioning System (GPS) which, when completed later this year, will consist of 24 satellites – each circling the earth every 12 hours. The US military can achieve an accuracy of 10 metres, but the Pentagon insists on downgrading the system for outsiders. Even so an accuracy of 100 metres can be achieved by anyone who has a receiver.

There are currently 12 GPS satellites in position offering navigation fixes for 14 hours a day. From June, Japanese motorists will be able to buy a decoder for 350,000 yen (£1,300) which will display their car's position on a 1:400,000 map on an LCD screen. The maps, which also show restaurants and hotels as well as roads, come on four optical disks which cover the whole of Japan and cost £40 each.

• In Britain two rival car navigation systems are about to be licensed, although neither uses satellite fixes. Trafficmaster, developed by General Logistics of Luton, uses an adaptation of a radio paging system to give drivers instant traffic news. Information is gathered from infra-red sensors on motorway bridges and the system should be up and running by August.

A second system, Autoguide from GEC, relies on infra-red transmitters at traffic lights to communicate with the car's navigation system. It uses a digitised voice and an LCD screen and the roadside transceivers exchange information with another transceiver mounted in front of the car's rear-view mirror.

When fully operational the system 'Mission Control' will be able to warn drivers of traffic jams and road accidents ahead. However, although a pilot scheme is under way in London, it is not expected to come on-line for three years yet.

Mice on the move

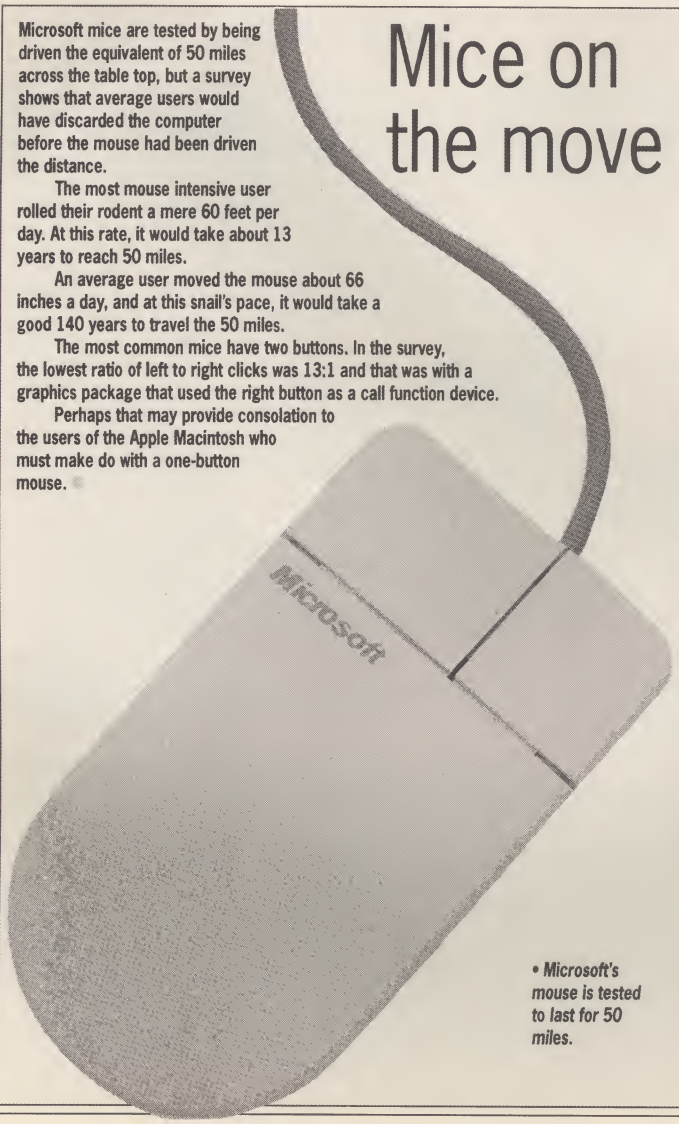
Microsoft mice are tested by being driven the equivalent of 50 miles across the table top, but a survey shows that average users would have discarded the computer before the mouse had been driven the distance.

The most mouse intensive user rolled their rodent a mere 60 feet per day. At this rate, it would take about 13 years to reach 50 miles.

An average user moved the mouse about 66 inches a day, and at this snail's pace, it would take a good 140 years to travel the 50 miles.

The most common mice have two buttons. In the survey, the lowest ratio of left to right clicks was 13:1 and that was with a graphics package that used the right button as a call function device.

Perhaps that may provide consolation to the users of the Apple Macintosh who must make do with a one-button mouse.



• Microsoft's mouse is tested to last for 50 miles.

12-bit sampler for the ST

AVR'S new Pro-Series 12 sampler is a plug-in cartridge with software which offers ST users 12-bit sampling, with samples replayable through a MIDI keyboard.

Along with *Drumbeat* and *MIDIplay* software, the package includes features such as fade in/out, echo, reverb, flange and filtering. On a standard 520ST sequences of around five seconds of audio, captured via phono leads, can be sampled and exported to the polyphonic drum and MIDI software for manipulation.

MIDIplay allows up to 128 samples to be sequenced across four voices. Pro-Series 12 costs £245. More info on 0582 457348.

Hacker nicked

The hacker who deleted valuable data from university computers and left childish taunts in its place has been convicted of causing malicious damage and remanded pending social reports.

Self-styled 'mad hacker' Nicholas Whiteley, a 21-year-old part-time computer consultant, penetrated databases at Hull and Bath universities and Queen Mary College London via the Joint Academic Network (JANET). He overloaded systems with data to stop them working and caused £25,000 worth of damage.

Whiteley carried out his six-month 'war' against academic computers using a copy of *The Hacker's Handbook* and an Amiga 1000. ■

COMMENT

The American bar room computer game system will make a welcome change from the usual anti-social alien bashing

America's interactive TV sports system (see page 3), with its bar-room Playmaker consoles, is not only an interesting and novel computer application – it's one that is coming to Britain in the near future.

Computerised entertainment came to the pub quite a few years ago in the now primitive-looking shapes of *Pong!, Space Invaders* and *Breakout* machines, and numerous and increasingly better arcade-style games have followed in their wake over the years.

With the questionable exception of trivia quiz games, pub coin-ops have tended to rival their fruit-machine cousins as more or less unsociable pursuits compared with the traditional pub games. A brave but dreadful video version of darts was once attempted, but the less said about that the better.

So it is perhaps time that the silicon chip made its presence felt in the great British boozer in a way that encourages customers to combine and compete rather than stand in a corner interacting with nothing more human than an animated martial artist at the other end of a joystick.

NATURAL

American football is, of course, the natural game for calling predicted plays. Reasonably long gaps in the action – there precisely for options to be considered and tactics planned – plus a largeish but formulated set of play variants allow the saloon bar strategist plenty of opportunity to predict the outcome of the next burst of activity.

But what else from the wacky world of *Grandstand* lends itself to this live action version of *A Question of Sport*'s What Happens Next?

Darts looks like a duffer, for example, with no more required than predicting that the projected porker will aim at the treble 20 most of the time, although you'd have to be familiar with Eric, Jocky and company's respective favourite 'outs'.

Snooker, too, has severe limitations. There's not much room for intuitive speculation when everyone in the country is predicting that 'Davis will go for a red, then a black, then a red, then a black...' and all getting it right.

SENSIBLE

In fact, though, when the system arrives the options will be pretty sensible all round. Tennis, golf and boxing should stay on the bill, and although soccer had the developers scratching their heads for a while before hitting a suitable formula for the set pieces, *Express* is collectively delighted to learn that cricket is 'an absolute natural'.

With Mike Brearley long retired from the game, though, it is to be assumed that the option 'The captain of the fielding team signals for the sun to move a little squarer on the leg side' will not be on the menu.

Negotiations with TV and satellite companies are still under way, and it is expected that the broadcasters will have to put on their thinking caps to find ways of offering extended live coverage slots (rather than magazine sports programmes which leap around according to where the action is the hottest) as their side of the bargain.

The current state of play, though, is that the organisers are confident of a launch in this country some time early next year.

Express hopes to have full exclusive details of the planned development in two or three issues' time. ■

FROM The ARCHIVE

ONE YEAR AGO

Detective Inspector John Austin, head of Scotland Yard's computer fraud squad, was pledging the firm hand of the law on hackers, wherever they lurked. In an exclusive interview with *Express* he confirmed that his purge would even reach the hobbyist's bedroom.

"Hackers won't be secure in their own homes because they're committing a crime," he said. "Hackers like to think they're clever, don't they? They think that way because they haven't been caught but we haven't got great armies of policemen chasing them yet."

One year on and a solitary hacker is convicted of hacking educational computers. And still not an army in sight.

15 year-old student Emily Holt won her school a complete facility kitted out with a dozen Acorn Archimedes computers. Her four-year project (she started at 11) involved lobbying governmental departments as well as industry giants like IBM, on behalf of the Camden Girl's School. Her aim was a craft, design and technology laboratory.

Her lobbying paid off when the Manpower Services Commission, Camden Consortium and Acorn got together and organised the 12 Archies and four BBC Masters. The facility was installed in a hut adjacent to the school.

A computer was developed that could replace drugs testing on animals.

The BioEngine was able to mathematically predict the behaviour of molecules when exposed to various drugs.

The BioEngine was targeted at those chemical companies who were searching for a way to avoid the suffering that testing was causing animals.

Compaq claimed that its Deskpro 386/33 was 'the most powerful PC in the world'. In a market growing as fast as the computer market though, it couldn't hold on for ever. The current incoming generation of 486s will soon make it look almost snail-like.

Anyone with £300 to spare and a thirst for knowledge about software protection could buy a two-volume tome listing all the major software protection cases in the US (yawn).

Welsh disk manufacturer Parrot turned up its toes and went to the great bird cage in the sky.

Parrot was set up with backing from the Welsh Development Corporation, but a series of problems caused £8 million of debts and its consequent expiry.

Claims were made that up to 1,500 spies were circulating around the United Kingdom visiting computer shows on the look out for high-tech information for technology-starved Russia. Information gathered was allegedly returned to Moscow to be pored over by the Russian scientists.

In the same article, computer magazines were reported as being shipped back to the USSR. That being the case, all the editorial staff here at *Express* would like to say hi to all our Red Square readers.

An *Express* report on Computer auctions revealed that there were bargain computers under the hammer. A PCW went for £25, but some of the 'bargains' were a bit long in the tooth.

Computer auctions show no sign of losing their popularity as thousands flock in the hope of getting a supercomputer for a song.

TWO YEARS AGO

A system program error in an air traffic control computer based in Chicago caused the whole system to 'black out'. Controllers went back to 'flying by the seat of their pants' and averted any major catastrophe.

Investigations were planned but two years later, a report from Australia earmarks air traffic control as one of the most potentially dangerous areas for computers to control.

Sources: *New Computer Express, Computer Talk, Computer Trade Weekly, MicroScope.*

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EDITOR • Martyn Lester
FEATURES EDITOR • Andy Storer
PRODUCTION EDITOR • Stuart Anderton
ART EDITOR • Amanda Cook
STAFF WRITER • Keith Pomfret
NEWS WRITER • Ian Pemble
DEPUTY PRODUCTION EDITOR • Ben Feinbaum

CONTRIBUTORS:
Rob Ainsley • Jerry Glenwright • Maff Evans
Steve Carey • Simon Williams • Robin Alway
Andrew Brown • Keith Neal • Jason Holborn
Bertram Carrot • Rod Lawton • John Torofex
Pete Gerrard • Mark Higham • Sally Newman

ADVERTISEMENT MANAGER • Mark Salmon
AD EXECUTIVES:
Simon Moss • Helen Kirkhope • Sophie Eades
AD ADMINSTRATION • James Leach
AD PRODUCTION • Frances Wasem
AD TYPESETTING • Terry Turner

ASSISTANT PUBLISHER • Jane Richardson
PUBLISHER • Greg Ingham

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BE THERE!

CPC

THE SAGA CONTINUES...

Those elusive 6128 ROMs are still turning up here and there, and being snapped up with every-increasing ferocity by owners who want to upgrade their 464s to 6128 spec.

The reason for the ROMs' scarcity is that the ROM manufacturer, Locomotive Software, found out that Amstrad was flogging off the 6128 ROMs individually. Locomotive decided it wanted a piece of the (financial) action and Amstrad basically said to forget it. Result? Locomotive bans the sale of 6128 ROMs on their own, Amstrad says it doesn't want to sell them anyway.

In the wake of that furore, mail order supplier WAVE hit the headlines when it scooped up 1,000 of the little beasties. These have sold out in no time, amid fears that they were the last there would be.

Well now WAVE has done it again. Not 1,000 6128 ROMs this time, but a mere 100. So if you still want to upgrade your 464, give WAVE a call on 0229 870000 to find out the current price – but you'd better hurry.

IONISER'S NEGATIVE EFFECTS

Mr K R Clarke of Halesowen has a very interesting little problem ...

"I am writing about my recent experience with an Amcor Air Processor/Ioniser. I first saw the Air Processor advertised in an Innovations catalogue and I was very impressed with its features (it cleans the air and releases thousands of negatively-charged ions – the ones you find on the tops of mountains. The last one to be seen in the city died a horrid death many years ago), so I decided I would buy one to help freshen up the atmosphere in my room. At this time I had nothing to fear, the advert told me it was perfect for the 'micro-climate'.

"A week or so later it arrived and I promptly unpacked the Ioniser, wired it up and plugged it in. Apart from the constant noise from the motor, I was quite happy until I switched on my CPC. On power up I could hear interference on the speaker so I switched off the Ioniser and the interference ended. I then went ahead and loaded *Purple Saturn Day* and once I was happily gaming away I switched the Ioniser back on. After around three seconds my CPC crashed – the screen covered itself with multicoloured lines and the computer started to load the next part without reason. I switched off the Ioniser and reloaded *PSD*, and when I switched the Ioniser on again the computer crashed as before.

"Is there anyone else out there who has had similar experiences with ionisers? My advice to anyone who is considering buying such a device is to think twice!"

INFINITE CHEATS

Are you having trouble getting past the Mutant Jellies on Level Nine of *Rampaging Megabrains from Zog*? What about the Eighteen-legged Cyberhordes in *Deathmash IV*? Can't find that last Runestone in *Quest of the Hairy Loonies in Loincloths*? Never fear, help is at hand. Where? Well in the new *Amstrad Action Cheat Mode II* book, of course!

Cheat Mode II: The Revenge is assembled from the last 33 issues of *Amstrad Action*. It contains:

- 750 cheats
- 400 pokes
- 16 maps
- And 150 additional, completely brand new and utterly never-seen-before pokes.

And that's not all. If you can't face the idea of typing in all those pokes by hand, you can also get the listings on cassette!

So how do you get your copy of *Cheat Mode ii*? Just send £9.99 (£11.99 if you want the cassettes) plus £1.45 p&p to: *Amstrad Action* Cheat Mode Book Offer, Freepost, Somerton, Somerset TA11 7BR.

JOIN THE ASTRO MARINE CORPS!

Spanish software house Dinamic is famous for two things: superb backgrounds, wicked sprites and ... OK, OK, three things: superb backgrounds, wicked sprites and almost impossibly difficult gameplay. Both *Army* and *Navy Moves* had opening sections that defeated just about everybody who tried them, and as for *Grand Prix Master*...

Well somebody must have dropped Dinamic a hint, because its latest release *AMC* (*Astro Marine Corps*) still has those superb background and wicked sprites, but lo and behold you can play it too!

A brief word about the plot. The Deathbringers are a bunch of mutants, rebels, intergalactic scum and generally unsavoury types who plan to take over the world. And the only way to stop them? Send one solitary, lonesome, single Astro Marine to their home planet to find their base and stop them before... yes, well, never mind that – let's get killin'!

There are eight sections filled to the brim with ghastly, ferocious and at times apparently unstoppable enemies. These include such oddities as man-eating plants and nasty blue dragons that attack you even when they're not on the screen!

Finish the first four levels and you get a password for the next four, in typical Dinamic fashion – it means that once you've conquered the first half of the game you never have to plod through it again. And with the ability to take nine hits before you die and five lives before it's game over, you stand a pretty good chance of getting there for once.

Mind you, *AMC* has nothing that's new. It's just another horizontally scrolling bloodbath at the end of the day. What raises it above the usual standard is the technical quality. The parallax scrolling is impressive and the monsters you face along the way very big, very colourful and very nasty indeed.

If you fancy having a go at wiping out the Deathbringers, it'll cost you £9.99 on cassette, £14.99 for a disk version.

Rod Lawton

BBC

E NUMBERS

I'm still eagerly awaiting the arrival of *E-type* for the BBC, partly because the Archimedes version was, in my opinion, the most fun game for that machine so far, and partly because there have been few good driving games for the Beeb.

As I write though, the release date (early May) is here and I've heard nothing yet from 4th Dimension. I've also heard nothing from Superior about its conversion of *Sim City* but, as release dates were vague on that one anyway, I'm not worrying yet.

LOOKING FOR CLUES

This week I'm going to be looking for some clues on the direction Olivetti, Acorn's giant parent, will be taking.

Revenues of $7.26 billion generating a profit of $163 million mean that Olivetti, although suffering from a squeeze on profits (down 46% despite rising turnover), is one of Europe's largest companies. This drop was blamed on falling margins which, as you will have gathered from my piece last week, is also Acorn's main problem.

Olivetti has largely left Acorn alone since the takeover, which surprised some analysts, who expected an invasion of spaghetti PCs badged under the Acorn name. So what does Olivetti want from Acorn?

It is unlikely to be any marketing expertise, although that has improved. It could be Acorn's presence in 95 per cent of British schools, but I don't think so. My guess is that RISC technology and the associated R&D work is what Olivetti really needs.

Workstations running power-hungry applications need all the speed they can get and RISC technology is now accepted as the best way of providing that speed. Acorn has the ARM processor and five years worth of development on the project already. Olivetti has already paid Acorn £1million for undisclosed rights to some of the ARM technology, so I am convinced that it is looking for Acorn to develop a super-processor similar to the Motorola 88000. This chip would provide a large part of the processing muscle needed by tomorrows, multiuser, multitasking, graphics intensive PC.

BETWEEN CHEVRONS

A new 4th Dimension game which has just landed on my desk is *Chevron*.

It's a horizontally-scrolling shoot-'em-up much in the vein of *Scramble* and *Defender*. The manufacturer claims that the graphics and game code take up over 100K of space, so it's not surprising that it comes on disk only.

The scenario is pretty standard – during the first Great Space War of 2100 titanium begins to run out, aliens try to invade the colony of Nevryon to get some of the metal and it's your job to stop them.

To be honest I don't know why they bother putting the scenarios for these shoot-'em-ups on the back of the box, everyone knows the object of the exercise is to kill everything in sight and that's all there is to it

Chevron does, however, look like a pretty good example of the breed.

Andrew Brown

YOUR FORMAT

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Archimedes 11
C64 11
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ST 16

SPECTRUM

COLOUR CODES

I wouldn't mind betting that a fair few bank accounts have been emptied in the cause of purchasing one of those trendy Star LC-10 colour printers. If you splashed out thinking dynamic, gushing and generally stunning technicolour screen print outs were only a few minutes of grinding printer noise away, but have so far found everything appears in black, white and lots of shades of boring grey, a utility called *Rainbow* should interest you.

It's a program which can apparently take any screens you care to load into it and persuade your Spectrum to, erm, produce a spectrum. Unfortunately for such an essential sounding purchase for Star colour printer users, *Rainbow* is only available on the Plus 3 at the moment. A copy on disk costs a very reasonable £5.95 including P&P from the oft-mentioned Garner Designs, 57 Lovers Walk, Dunstable, Beds., LU5 4BG.

MICRODRIVING

You may remember me enquiring, although I won't blame you if you don't, about the location of Microdrive cartridges on behalf of a sadly cartridge-less chap by the name of James Taylor.

Some kind readers answered his plea with details of outlets selling the damn things. The latest correspondence in this completely fascinating, long-running saga, is from the Sinclair specialist EEC Ltd, who I've plugged in the past for selling extremely cheap Spectrums.

The company was rightly peeved to see its name wasn't mentioned as a supplier of cartridges, despite the fact that it's been selling them with ads in *Express* from early on and has a good 30,000 of the small After-Eight-Mint-shaped pieces of plastic that are Microdrive cartridges in stock. It tells me that it "can supply new cartridges in four pack wallets of four or plastic boxes of 20..." and complete Microdrive expansion kits are also available from EEC Ltd, 18-21 Misbourne House, Chiltern Hill, Chalfont St Peter SL9 8UE (Telephone: 0753 888866).

CLUELESS

Harry Harper of Coventry wants to hear anything about a Spectrum emulator for the PC which was mooted in *Express* last year. I'm clueless but if you've got any info send it to me at *Express*.

Robin Alway

POKE CITY

The biggest, sincerest and most fawning thanks I can muster at short notice go once again to our friend Jon Rose who has just plied me with his latest batch of pokes. The following pretty insignificant looking numbers will, as if by magic, give you the stated eternal benefits when inserted into the right game with the aid of a Multiface or similar device. Jon tells me all the pokes are for the 128K version on the unlabelled side of the game cassette and, hopefully, if we all promise on our Speccys to buy him a drink whenever we meet, Jon will let us have some more.

GAME	POKE	EFFECT
Black Tiger	40289,0	Infinite vitality
	45583,0	Infinite lives
Rainbow Islands	65110,0	Infinite lives
Sonic Boom	31590,Lives	(only works after a credit has been used)
L A Drugs Bust	49972, No. of enemies to kill	

SAM COUPE

BORING AND OBVIOUS

Unlike your columnist, Derek Morgan of Lancashire has already grasped all the boring and obvious stuff in the Coupé manual and now wants to share some of SAM's innermost secrets with us. Here, for your delectation, are a second group of pre-defined function keywords that aren't mentioned anywhere in the handbook.

```
[0] DEF PROC    [1] END PROC
[2] RENUM       [3] DELETE
[4] REF         [5] COPY
[6] -           [7] KEYIN
[8] LOCAL       [9] LOOP IF
```

He was also kind enough to supply me with an excellent little program which I'll treat you to next column. In the meantime, a huge round of applause for Derek! Just as soon as I get something suitable in the way of Coupé software he will receive it as a mark of our gratitude. If you'd like some free SAM software send your Coupé hints, cheats, wrinkles and pokes to me at *Express*, 30 Monmouth Street, Bath, BA1 2AP.

PRICE UP

MGT has just told me some good news and some bad news. Bad news: the price of the basic SAM Coupé has been raised £10 to £179.95 Good(ish) news: all disk-based SAMs will be the same price for the forseeable future.

MGT also has a new address.The new premises are apparently "essential to the growth of the company" and important if it is to meet the increased demand for Coupés that is sure to come this Christmas. The new address is: Miles Gordon Technology PLC, Century Park, Valley Way, Swansea SA6 8QP. The telephone numbers remain the same.

Robin Alway

PCW

SCAN REWARD

Creative Technology, maker of the excellent desktop publishing program *Micro Design*, is said to be working on a new version capable of working with a hand scanner.

A hand scanner is a small device the size of a Walkman that you can roll over a page of text or graphics. It converts the picture into a disk file that can be incorporated into a *Micro Design* document – giving you a quick and easy way of putting illustrations into a newsletter or other publication.

The scanner should be in production by the end of this year and will be about £195 (my estimate, not theirs).

GAME FOR A LAUGH

CDS Software is bringing out a new games compendium for the PCW. For just £20 you get backgammon, darts, dominoes, plus various card and word search games.

I haven't seen one yet but I bet it's good: CDS has brought out some very good games in the past including *Steve Davis' Snooker*, a great snooker and billiards program despite all the balls being greens! Details on 0302 321134.

ADDRESSING THE PROBLEM

Putting the address in the right place on an envelope is a tricky business – especially as you often have to work with envelopes of varying sizes.

Here's one way to do it. Insert the envelope into the printer. Wind it up until the print head is at exactly the level you want.

LocoScript 1: Press [f1] 'Options' and, using the cursors and the [+] key select 'Single sheet paper'. [ENTER]. Press [f3] 'Actions' and type in a left offset of about 30 then [ENTER]. The print head moves across to that setting.

LocoScript 2: Press [f3] 'Paper' and using the cursors and the [+] key select 'A4' [ENTER]. Press [f6] 'Left offset' and type in a left offset of about 30 then [ENTER]. Again the print head moves across to that setting.

If it's at the wrong place for the address, type in another figure and [ENTER] until you get it where you want it. Clear the printer status line with [EXIT] and press D in the disc manager for 'direct printing'. Type the address and leave direct printing with [EXIT].

INDEXING, THE PROGRAM THAT DOES

Barry White of Bournemouth asks me if there is an easy way to index the book he's writing in *LocoScript*. Yes, there is: buy *Ansible Index* a special indexing program for *LocoScript*ers for £30 from Ansible on 0672 62576.

It's fast, easy to use and has a manual in plain English.

NO ONE QUITE LIKE GRAMMER

Had to laugh at a press release I got about a new PCW program to help teacher with their mark sheets. The circular described it as being developed in conjunction with teachers at "Friern Barnet Grammer School".

If you can read this, thank a teacher...

Rob Ainsley

MSX

ALL FORMATS

Don't forget that the second of this year's All Formats Computer Shows is being held on June 9 and 10 at the Royal Horticultural Halls in London. The organisers are hoping to include a section for the MSX user, so keep reading this column for an update on this event.

KNIGHTMARE TIP

Here is a tip for the Konami game *Knightmare*. Pause the game, (F1), type in MARE18TH and press enter. You should obtain 99 lives and be near to the shield. Also for this game, hold down the I,N and the left and right cursor keys for an extra 25 lives. If you hold down the left cursor key and select key you will become invisible for 90 seconds.

Thanks to all who write in with tips, your help is much appreciated.

MONITOR TIP

A gentleman by the name of Nigel Myers kindly sent me a tape which contained a couple of useful utilities for the MSX user. These are a memory monitor and a memory peeker for the MSX computers and, although the listings are fairly short, they are well structured and quite powerful. The first program displays the entire contents (64K) in correct hex notation and the character equivalent for the given address is printed.

```
1 ' Memory Mon. by NIGEL MYERS
2 ' For "NEW COMPUTER EXPRESS"
3 '(variable "A" is the start
address you wish to peek from)
10 SCREEN 0:WIDTH
40:KEYOFF:A=0
20 FOR R=A TO 65535!:LOCATE
0,24:PRINT HEX$(A);:FOR X=5 TO
25 STEP 2
30 IF PEEK(A)<16 THEN LOCATE
X,24:PRINT "0";:GOSUB 60 ELSE
LOCATE X,24:GOSUB 60
40 IF PEEK(A)>31 THEN LOCATE
26+X/2,24:PRINT CHR$(PEEK(A));
50 IF A<65535! THEN A=A+1:NEXT
X:PRINT:NEXT R ELSE END
60 PRINT HEX$(PEEK(A));:RETURN
```

The second program, the memory peeker, is similar to the above but the memory contents are not displayed. Instead, the character codes are displayed across a longer line, giving an easier to read display.

For those who own a Toshiba HX/10 computer, list either program and change the variable A to, start at 15734. This displays the range of error messages available; use the stop key to pause or continue the display. This may also work on other MSX machines.

```
1 ' Memory Peeker(v2) by NIGEL
MYERS
2 ' For "NEW COMPUTER EXPRESS"
3 '(variable "A" is the start
address you wish to peek from)
10 SCREEN 0:WIDTH
40:KEYOFF:A=0
20 FOR R=A TO 65535!:LOCATE
0,24:PRINT HEX$(A);:FOR X=5 TO
38
30 IF PEEK(A)>31 THEN LOCATE
X,24:PRINT CHR$(PEEK(A));
40 IF A<65535! THEN A=A+1:NEXT
X:PRINT:NEXT R ELSE END
```

Thanks to Nigel for the listings.

Keith Neal

C64

ETHICAL OR WHAT?

In *Express* 78 I mentioned a magazine called *Crystal News*, the magazine for the Crystal Unicorn System (or Club to you and me). I have just received a second copy of the magazine, the May issue, and can confirm that the quality is as good as ever.

Only one thing concerns me, and that is a POKE and SYS call that gives anyone owning a game written using the shoot'em-up construction kit, access to the entire *SEUCK* program itself. For a magazine that is so firmly against piracy this seems to be a strange thing to do. Would our Atari friends like cheap copies of STOS or our Amiga friends cheap copies of AMOS? Of course they would but I don't think Mandarin would be too happy about it. That not withstanding (and I'll bet one or two of you will write off for the magazine) the address to write to has changed from the last one I gave you. Now you have to write to Adam Whittle, a 64 whizz kid if ever I saw one. Adam lives at Redways, Hartshall Road, Walton Highway, West Walton Wisbech, Cambs PE14 7BJ.

WHICH COMPUTER?

One of the people at Crystal Unicorn (I presume it's Steve Smith) has got a 512K computer that runs at 4.09MHz and has a 40Mb hard drive. You could have many guesses as to which one it is, but not many people would immediately think of the right answer. The computer in question is a Commodore 64 and if that doesn't get you sending off for the May issue (with more details about this amazing but true computer) then nothing will.

WHICH POKE

Another half dozen games under the hammer this week giving you cheat modes galore:

Slug POKE 9420,173:SYS 11619
Thunderblade POKE 13622,44:POKE 8500,44:POKE 13135,44:SYS 4092
Thundercats POKE 35088,173:SYS 2061
Buggy Boy POKE 39945,96:POKE 2048,32:POKE 2050,13:POKE 2049,104:SYS 2048
1985 POKE 24036,0:SYS 20000
Gianna Sisters POKE 8257,173:SYS 2098

It never ceases to amaze me how people find these things out and many thanks go to all concerned. Keep up the good work!

LET'S GET TECHNICAL

Mr Mardell writes in with a spot of technical advice from Stoke Newington in North London. I used to live in Alkham Road, Stoke Newington. I wonder if he knows it? Anyway, the advice in question concerns the C2N cassette recorder, and a query that came in a while ago about the connections to the plug for it. The colours used by Mr Mardell when he recently repaired a cassette deck are blue, brown, white, red, –slot–, green (+5V), and black (ground).

Pete Gerrard

QL

MORE APL

A few issues ago I mentioned MicroAPL's implementation of APL for the QL.

If you've seen the light or you are already a devotee, you will find membership of the British APL Association very useful – it publishes *Vector*, a very informative quarterly journal, for an annual membership fee of £10. For more information contact the secretary, Graham Parkhouse, Department of Mechanical Engineering, University of Surrey, Guildford, Surrey.

PD APL

A public domain version of APL for the QL was being produced under the aegis of I-APL Ltd. Unfortunately it was never completed. I have a beta test copy and it works quite well, apart from there being no file I/O.

If anyone is interested in continuing with this project please contact: Anthony Camacho of I-APL Ltd at 2 Blenheim Road, St Albans, Herts, AL1 4NR. I-APL Ltd also supplies PD versions for the PC, Beeb and Archimedes at £4.50 a throw, if any users of these machines read this column.

MICRODRIVE CARTRIDGES

I reported some time ago that Ablex had no intention of resuming production of Microdrive cartridges.

There appear to be very few new cartridges around and some software suppliers are asking customers to provide their own media, if they require software to be supplied on cartridge.

Although Sinclair's decision to use Microdrive storage on the QL has been ridiculed in some quarters, Microdrive technology had quite a lot going for it at the time. Similar systems had been fairly successful on other machines, such as the Aculab Floppy Tape on the Tandy TRS-80 Model I and Microdrives fitted in quite nicely between ordinary cassette storage and floppy disks.

Used carefully, the cartridges are quite reliable and access times acceptable, especially for users with no experience of floppy disks. About 100K is available on each cartridge and they can be carried around in one's pocket, without any problems.

In fact at one time the QL was embargoed for export to communist countries under the COCOM regulations, not because of its performance but because the Microdrive data storage density was too high for the regulations!

QL SPEED

I recently compared the speed of my QL with the Opus XT clone, running the same C programs, compiled with Lattice C on the QL and Zortech C on the Opus. With the Opus running at the standard XT speed of 4.77MHz I was pleasantly surprised to see that the QL was a bit faster than the Opus.

Of course, with the Opus running at its normal speed of 10 MHz it was about twice as fast as the QL.

John Torofex

XE

NEWS FROM THE CITY...

I hope all of you who have access to modems have been logging on to the City bulletin board regularly and contributing to the forum there. For those of you who don't know, the City is a bulletin board entirely devoted to the Atari 8-bit – at least it was. Recently, many other computer enthusiasts have been logging on to the City – no bad thing, right? – but because the City is entirely user-configurable, particularly if you have Guardian or Sentinel status, it tends to become clogged with extra menus which have limited appeal – except to whoever created them!

This problem has been growing and growing to the point where it's almost out of control. Menus hither and thither devoted to every subject have ensured that space is getting tight and the 8-bit gets less of a look-in. This is obviously an unnecessary situation because the 16-bitters are already well catered for elsewhere.

Don't worry however, because the City's creator, James Bastable, has recognised the problem and is taking steps to ensure the City remains for and by the Atari 8-bit community. How is he doing this? Simply by clearing the board of unsightly and boring 16-bit menus. And how are you going to reward James for this fearless devotion to our favourite machine? By logging on, that's how! Get out there with your modem and start calling. The City can be contacted by calling 021-353 5486 with a variety of speeds including V21/V22/V23 and now the superfast V22bis. **Edmund Blake**

ARCHIMEDES

FIREBALL II

Cambridge International Software sent through a copy of *Fireball II* this week. Although not exactly hot off the press, I was pleased to see it as it is probably the best example of the bat 'n' ball genre on the Arc. As an extra incentive, there's a copy of the original *Fireball* on the release disk as well.

Fireball II adapts the familiar *Arkanoid* ideas with a fair degree of originality. Capsules aren't dropped directly from bricks, but bounce diagonally off the walls at varying angles. This makes them harder to capture and to avoid. There are two negative capsules, which take away extra equipment and reverse bat direction.

The positive ones include a ball doubler, multi-ball launch, no brick-reflect, auto-lasers, bat doubler, bat snaker, sticky ball, wave jump and bat protect. The last of these is only useful in higher levels, when certain bricks produce green fireballs that are fatal to the touch. The centre and right mouse buttons can move the ball along the bat when you add sticky ball to your arsenal.

Screens start easy and progress fairly smoothly in difficulty. There are several screens where one capsule is particularly useful in completing the wave. Graphics are nicely implemented, though there's nothing particularly startling. Sound is rather better with a good, if rather repetitive, soundtrack and an excellent series of digitised spot effects. These include a manic laugh when you lose a life, 'Relax' when you hit pause and 'Sound Ceased' if the neighbours get fed up with the game's effects.

Fireball II also includes a screen editor, so you can lay down your own waves of bricks, alter existing waves and rearrange the order in which they're played. This greatly extends the playable life of the game. At £24.95 it's about par for the Arc course, and comes recommended. If your local dealer doesn't have a copy, ring Cambridge International on 071-833 4023.

LASER DRIVER, PART 32476C

As, hopefully, the last word on the Acorn laser driver and its default setting of 150dpi, please consider the following. If you buy a 9-pin dot-matrix printer, it is almost certainly because you're on a budget and computing at home. You're probably as likely to print listings in draft mode as you are letters in NLQ.

If you can run to a 24-pin dot-matrix, you're likely to want its LQ mode more than its draft, so it would be more sensible for software to default to that. By the time you get to the cost of a laser, you've either got a lot of money to hand or you're using your machine for semi-professional work. As such, you expect your software to give of its best. Defaulting to half the printer's available resolution, which some lasers can't actually reproduce, is daft.

It's a small point and really not worth getting wound up about, but it's still a daft default.

Bertrum Carrot

ARXE ABOUT EMULATORS

A lot of interest is being shown in a new, small but leading-edge software house called Arxe Systems. The reason for this is that Onkar Jagpal, the brains behind the outfit, has just put together a Spectrum 48K emulator for the Arc. No, don't laugh; it has quite a lot going for it.

For a start, you should be able to pick up the emulator and five games for £20, which is cheap by Arc standards.

The games may squeak a bit, especially if the piezo-electric 'loudspeaker' of the Speccy is emulated, but there are still some very playable games available for the machine.

Even more interesting, though, is the other emulator Jagpal is working on – a 68000. Although an emulator for the base processor is not that exciting, if it were accompanied by emulations of the ROMs for ST, Amiga or Mac, there would be a lot to get agitated about. Of these, the easiest would probably be the ST.

Following this train of thought to its logical conclusion, would give us an Arc with a sudden surfeit of new software, both serious and games.

And, of course, there's a very acceptable Mac emulator, the Spectre, for the ST.

Ah, what it is to dream!

PC

CASIO CALENDAR

Almost all PC users will have a use for a pocket organiser. Some will call it an address book, some will carry a Filofax, the wealthy may run a Poqet PC. It looks as if there will be another choice before long. Casio is announcing a range of five pocket diaries, at prices varying from £80 to £190.

All but the entry-level model boast 32 x 6 LCD screens, and all offer miniature QWERTY keyboards and numerous other keys to control their many functions. Built into the 150-300g units are address files, clocks, schedulers, calculators and room for the odd memo. The top of the bunch SF9000 features 64K of main memory with room for a further 64K memory card which may be either ROM or RAM. ROMs will include a spell checker and thesaurus.

Casio already claims 40 per cent of the electronic pocket organiser market, and aims to take a larger chunk of this from the likes of Psion and Sharp this year. The design of its new range could well put it in an even more commanding position. Check out Dixons or ring Casio on 081-450 9131 for the address of your nearest dealer.

THUNDERSTRUCK

Really Matt Nicholson's department, I guess, but I thought I'd mention how much fun the new PC game *Thunderstruck* is.

The game is due out in June and I've been playing a demo version of it for the last week or so. The game drops you as pilot of a ground-skimming fighter into a game arena populated with robotic drones. You have to guard a series of installations from attack by the drones, while trying to search out and destroy the generators which are producing them.

The fun element of the game is in the manoeuvrability of the ship and the quality of the 3D graphics. The patchwork landscape rolls smoothly around under your ship which is viewed from behind and slightly to one side, or more appropriately perhaps, from a camera ship trying to stick to your tail.

Control is with mouse or keyboard and I find the whole game very addictive. It will be published by Millennium software at £29.99 and the demo I've been playing will appear on the July *PC Plus* cover disk.

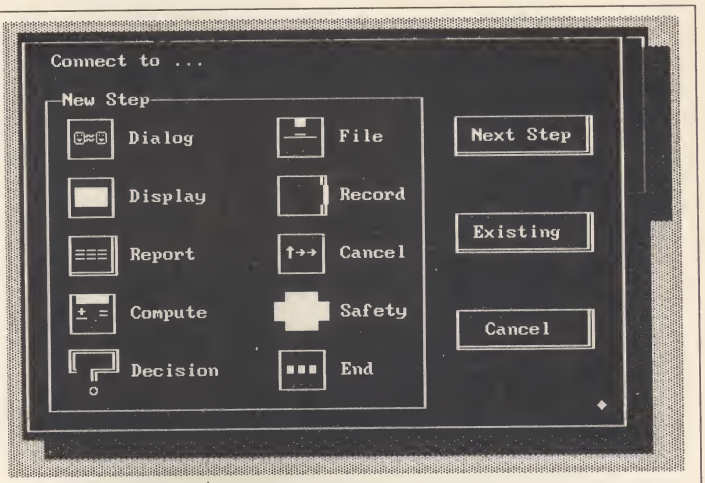
Well worth a shot or two hundred, if you own an EGA or VGA monitor.

THE KEYCODES SCAN

When you're writing batch files of programs to detect keypresses on a PC, there are at least two systems of coding that you need to bear in mind.

The ASCII set is the most common, but has the disadvantage that there are no codes for the special keys on the keyboard, such as function keys, cursor controls or the numeric keypad. For this reason, the designers of the PC included a system of scan codes, where each key has a unique code.

The right software, such as Clockwork's *GET* routine, returns these scan codes as errorlevels, which you can then build into your batch file to handle responses from the user of the program. Clockwork is on 0705 483217.



• **Cause, *a hypertext database program from the States.***

A GOOD CAUSE

The US hypertext-style database program, *Cause*, is beginning to come into its own with the release of a series of pre-written programs, called *Effects*. These applications add some fun to the genre, as they're all WIMP-based and aim to make the jobs they're aimed at easier to do on a computer. Details from Keyword Software on 09424 1172.

SYNCHRONICITY

For many years people have been saying "That's a strange coincidence". Recently, various studies have been made of these coincidences and a theory called synchronicity has been put up to cover them. A prime example of its working happened to me this week.

I had to ring the States to talk to a company about compression routines. When I got through, a recorded message said something like "If you would like to make a retail order, press one. If you would like to make a technical enquiry, press two. If you require operator assistance, press three etc". Pressing the appropriate key on my telephone keypad directed the call to the right destination. 'Damned clever, these Yanks', I thought to myself.

What should arrive in the post the same afternoon, however, but a press release from IBM, detailing its 'voice-enhanced applications'.

Among the new announcements was the 9270 Voice Response Unit, which allows a caller to "enter choices and data via the telephone keypad as if he were making a normal call. The VRU responds with prompts, or the information wanted by the caller, spoken in a human voice, pre-stored in digital form." Coincidence, or what? IBM is available on 0705 321212.

MORPHIC RESONANCE

On a related subject, I went on a short course at the weekend on the subject of resonance.

Half of this was devoted to chanting and voice work and the other to a discussion of morphic resonance. This is another interesting theory, put forward by the Cambridge biologist, Rupert Sheldrake. Very basically, it claims that a 'group memory' is at work in the universe, such that if an event occurs, the chances of that event occurring again are increased.

Experiments with the formation of crystals, the boiling points of new compounds and the ability of rats to solve mazes give substantial support to the theory.

The most interesting experiment to date involves two groups of people attempting to solve the *Evening Standard* crossword, one group the day before it is published and the other the day after. Neither group knows what they are to be asked to do, so there's little chance of 'mugging up' the answers. The group solving after publication, when thousands of people have already worked on the puzzle in the paper, are found to be around 20 per cent better at the puzzle than those working before publication.

So what's this to do with computers? Well, an April Fool spoof based around Sheldrake's work was published in the magazine *Computer Shopper*.

The article claimed that European scientists, including one named Dr Lora Pfilo, had discovered decreases in the time taken for repeated runs of certain computer programs.

Sheldrake contacted the author of the piece to point out how close it was to what he believed might actually be the case. It now seems that further research may be continued along these lines. Anyone fancy taking part?

BROUGHT UP BY STANDARDS

As the quickest magazine on the planet to pass on information to PC users, I should mention that in trying to standardise file types on *PC Plus*'s cover-mounted disk last month, I inadvertently changed the name of the manual for the unusual *MindReader* word processor.

This means that when you chose to print out the manual, the program can't find the relevant file. Changing the name `MANUAL.DOC` to `MANUAL.MR` will correct the problem. Alternatively, you can print it directly by typing `COPY MANUAL.DOC PRN:`. If you haven't come across *MindReader*, it is a shareware word processing program which attempts to finish your words for you when you type. It uses artificial intelligence techniques to learn the commonest words you use. It's main uses are probably for the disabled to save painful typing.

Simon Williams

THE MANHOLE

GAME of the WEEK

Activision • £39.99

Click on a dragon and it offers you a biscuit; a whirlpool where find yourself floating on someone's cup of tea; a rabbit being offered that very same cup of tea somewhere else; a TV floating through the screen to the bottom of the sea. *The Manhole* has all this and more, presented in a way that even a four year old can understand and use.

There are precious few decent packages around for kids, most coming from the States. *The Manhole* first appeared on the Macintosh about two years ago, and is now available on the PC over here.

It is essentially a graphic adventure with over 600 beautifully drawn pictures, many animated and all linked so that clicking the mouse on many of the objects leads on to another picture. It can also be controlled by joystick or keyboard, but mouse is the easiest.

The most obvious things to select are doorways, ladders or hatches, and most lead into new locations. However clicking on many other objects lead to unexpected surprises – clouds of fishes appearing before your eyes, pictures on the wall that come alive, stars that shoot across the sky. Some of the creatures even talk with surprising clarity through the PC's speaker.

The game borrows heavily from *The Lion, The Witch and the Wardrobe, Wind in The Willows, Alice in Wonderland* and *Winnie the Pooh*, but is nonetheless totally original. There is no plot as such, and there are no puzzles. All you need do is explore, and certainly my five-year-old daughter shows no sign of getting bored.

My only criticism is the price, but then it does contain over 2Mb of compressed picture data and comes on five disks. It also has some excellent music if you have an Ad-Lib or Roland sound card.

Matt Nicholson

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AMIGA

GFA STUNNERS

After stumbling at the starting blocks, GFA Data Media's Amiga version of its highly-regarded BASIC language system, GFA BASIC, is finally starting to make a name for itself among Amiga owners. According to GFA (UK), sales of Amiga GFA BASIC have far surpassed expectations, which is good news for both GFA UK and for future GFA products on the Amiga (perhaps GFA will now consider converting ST programs such as *GFA Draft* and *Raytrace*?).

Due for release some time in June on both the ST and the Amiga is GFA BASIC 3.5, a vastly upgraded version of GFA BASIC that offers 50 new BASIC commands.

According to the company, most of these new commands are aimed at matrix manipulation, therefore making GFA BASIC the ideal tool for array manipulation and 3D graphics work. New commands include MATREAD, MATCOPY, MATSET and MATMUL, all of which are matrix manipulation tools (you should be able to work out what each does by yourself, so I won't go into too much detail).

To complement this new release, GFA intends releasing an upgraded version of the GFA BASIC Compiler to cope with the new commands.

As always, GFA plans to allow existing users to upgrade easily – contact GFA on 0734 794941 for specific details.

No news yet about the eagerly awaited GFA Assembler – GFA is keeping rather tight lipped about this one. However, GFA claims that the program is virtually finished and shouldn't be too far off now – as always, I'll bring you more details when they are made available.

As a side line, Amiga owners may be interested to hear that GFA is to produce PC and Unix versions of GFA BASIC. The Unix version is to be called GFA BASIX (imaginative lads, the GFA'ers!). GFA hopes that this will open doors to considerably more users as this new release will be usable on just about any system that supports the Unix standard (including the Amiga Unix card, AMIX).

With this latest release, GFA hopes to put GFA BASIC up in line with industry standard BASICs such as those produced by companies like Microsoft. If GFA BASIC is accepted within the professional applications market, this could allow third-party software developers to easily and quickly produce versions of their software for the Amiga, ST, PC and Unix markets.

PRO-24 LATEST

Suffering Amiga musicians haven't long to wait now for Steinberg's long awaited MIDI sequencer system, *Pro-24*. OK, we've been hearing words to that effect from Steinberg and its UK distributors, EvenLode Soundworks (099 389 8484) for about the last six months, but it seems that the wait is almost over.

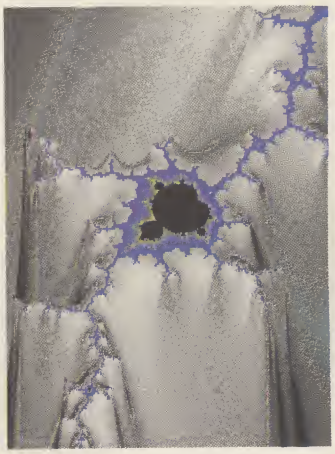
According to EvenLode, all problems with *Pro-24* have been sorted out and the company is looking at a late June launch date for what has become one of the most eagerly awaited Amiga music products ever (apart from *Music-X*, that is!).

Unfortunately for Amiga musicians on a tight budget, Amiga *Pro-24* certainly isn't going to be cheap – expect a price of £285. Although *Pro-24* is £60 more expensive than its main rival, *Music-X*, the product is sure to receive a warm reception from musicians used to using the ST version (which has practically become an industry standard).

Steinberg claims that Amiga *Pro-24* is a completely new piece of software and is not just a straight port from the Atari version as many first suspected (shame on them).

All essential functions of the latest *Pro-24* III version have been adopted (read between the lines – does this mean that Steinberg has removed features that it believes to be non-essential?). Additionally, numerous new features have been added that Steinberg claims will make working with *Pro-24* even more efficient and comfortable. Needless to say, as soon as I can get my hands on a copy (are you listening, Evenlode?), I'll bring you a full review. In the meantime, here's a list of what Amiga *Pro-24* has to offer:

• 24 independent tracks with up to 9,999 bars (Should be enough for most of us, but many Amiga owners may feel rather restricted when you consider that even *Music-X Junior* offers 250 tracks!)



• ***Stunning 3D fractal graphics with MandelMountain – and the program is available for nothing!***

• High resolution of 96 ppq. (Hmm. 96 ppq isn't what I'd call high resolution – *Music-X* offers a recording resolution of 196 ppq. Dr.T's *KCS* offers a resolution of 396 ppq!)

• Tape mode and pattern orientated operation may be combined.

• Numerous recording functions allow for automatic Punch in/Punch out. Auto-Record and simultaneous recording on several tracks (a nice touch, and very useful).

• Grid Editor for easy graphical editing of MIDI performance data.

• Drum Editor offering special functions for recording percussion parts. (Very nice indeed – this is one of the few MIDI utilities that Amiga musicians have been crying out for because not a single Amiga music package offers this excellent facility!).

• MIDI Mixer – mix down your song on screen (From what I've seen of this feature, it looks very similar to the AutoMix option available within Dr.T's *KCS* v3).

FRACTAL SCORCHER

Wanna be blown away? Wanna experience the feeling you get when your Amiga does something so amazing that your chin hits the floor with such an impact it crashes your hard drive? If so, you've got to check out *MandelMountains*, the latest Mandelbrot generator for the Amiga!

"But Mandelbrot generators are for spotty computer buffs whose idea of a fun is disassembling the Amiga ROM". If this is your view, then you're in for a shock – just check out the image on this page and I'm sure you'll agree that the results *MandelMountains* can produce are certainly striking. OK, the mathematics involved are pretty boring to say the least, but who cares when the results are so impressive!

If you haven't already sussed it our for yourself, *MandelMountains* is a Mandelbrot generator with a difference. Instead of producing 2D Mandelbrots (which can justifiably be regarded as tame stuff these days!), *MandelMountains* renders 3D, elevated views of the Mandelbrot set. As you can see for yourself, *MandelMountains* even calculates light source shading.

If this has sufficiently whetted your appetite, then why not give your friendly PD supplier a bell (yes, *MandelMountains* is PD!); The program is available on Fish Disk 295.

Jason Holborn

AMIGA GAME of the WEEK

SKIDZ

Gremlin • £19.99

Skateboarding is in again, and, as with all areas of marketing, the computer software trade likes to capitalise on crazes. The last wave of skateboarding brought us Atari's *720 Degrees* and Electronic Arts' *Skate or Die*. Now the next generation of concrete surfing has arrived, Gremlin has decided to cash in on the act by releasing *Skidz*.

The game places you as a youth with sterling community spirit, in other words the only one who can be bothered to pick up the rubbish! You have set yourself the task of making the town cleaner by picking up at least 75 per cent of the trash in the town's dirtiest areas, namely the main street, the park, the local building site, Chinatown, the canal and the boardwalk. You can choose to pull on your scruffy jeans and ride your BMX or kick ass in your most colourful street-wear on your trusty skateboard, each with its own advantages and drawbacks.

The other townsfolk are a pretty careless bunch and will wander around getting in your way, wasting valuable time before the infamous 'litter spirit' comes on to steal your energy.

Extra energy can be found by picking up useful things such as food and tools, or by buying top-ups in the local shop. For this you need some of the old spondulicks, the moolah, the dosh – *money*!

Cash is obtained by collecting carelessly dropped coins and notes, or performing tricks off the ramps left by other skate-fiends.

Once the town has been cleaned up, you can enter a race across a special circuit, but get some practice in, as the opposition is hot!

Rather surprisingly, *Skidz* isn't just another 'fad' game that falls flat on its face.

The sound is racy and the graphics are excellent, with some well-drawn sprites whizzing about colourful and atmospheric scenery. The presentation is backed up with incredibly addictive gameplay, loaded with a superb sense of humour running throughout.

Even if the very thought of placing wheels under your feet and flying around the streets unprotected fills you with dread, have a try at *Skidz*.

Don't worry, the wild shorts and big trainers are optional!

Maff Evans

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		MONO £	CGA £	VGA MONO £	VGA COLOUR £
PC 10	SD	494	629	649	736
PC 10	DD	551	690	707	795
PC 20	HD20	675	799	846	929

(As PC 10 SD but includes hard disk drive)

80286; 6/8/12mhz; 1mb ram; 3 slots; serial/parallel ports; clock; 1x 1.44mb drive; MS DOS 4.01; GW basic and manuals.

		MONO £	VGA MONO £	VGA COLOUR £
PC 30	HD20	967	967	1128

SAMSUNG (monitor not included)

ALL MODELS INCLUDE ONE YEAR ON-SITE MAINTENANCE

8088; 4.77/10mhz; 640K ram; 6 slots; serial/parallel ports; clock; 1x 1.2mb drive; MS DOS 3.3; GW basic and manuals.

	MONO/COLOUR £	VGA £
SPC 3000/1 SD	410	519
SPC 3000/2 DD	473	581
SPC 3000/3 HD20	676	784

80286; 8/12mhz; 1mb ram (exp. to 5mb); 5 slots; serial/parallel ports; clock; 1x 1.2mb & 1x 1.44mb drives; MS DOS 3.3; GW basic and manuals.

	VGA £
SPC 6512/1 DD	1029
SPC 6512/2 DD HD20	1306

HYUNDAI (monitor not included)

8088; 4.77/10mhz; 640K ram; 5 slots; enhanced keyboard. Includes: serial/parallel ports; clock; 1 or 2 360K drives; MS DOS 3.3; GW basic and manuals.

	MONO £	EGA £
SUPER 16TE SD	*419	452
SUPER 16TE HD30	589	658

*SPECIAL INTRODUCTORY OFFER ON SUPER 16TE SD MONO ONLY . . . INCLUDES 12" MONO MONITOR . . . £399

80286; 8/12mhz; 640K ram; 6 slots; enhanced keyboard. Includes: serial/parallel ports; clock; 1 or 2 1.44mb drives; MS DOS 3.3; GW basic and manuals.

	VGA £
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MONO	PHILIPS	BM 7913 FST	12"	80
MONO	SAMSUNG	MA 2671/3/5 FST	12"	81
MONO	AKHTER	MONO 14 FST	14"	79
MONO VGA	PHILIPS	BM 7749 FST	12" p/w	107
MONO VGA	AKHTER	VGA 14M FST	12" p/w	99
MONO VGA	SAMSUNG	ML 2611	12" p/w	81
MONO VGA	SAMSUNG	ML 4571	14" p/w	95
MONO A4	SAMSUNG	MP 5671(inc. card & drivers)		634
CGA	PHILIPS	CM 8833	14"	209
EGA	PHILIPS	CM 9073	14"	289
EGA	SAMSUNG	CM 4551	14"	281
VGA	HYUNDAI	HDM 401 FST	14"	253
VGA	PHILIPS	3CM 9809	14"	372
VGA	SAMSUNG	CJ 4581	14"	281
VGA	AKHTER	VGA 14	14"	273
MULTISYNC	SAMSUNG	CT 4581	14"	340
MULTISYNC	AKHTER	ECM 9600	14"	360
	MDA/CGA CARD with PRINTER PORT			45
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C5 HITS THE STREETS

No, not Sir Clive's rather daft venture into motoring, but HiSoft's somewhat delayed version 5 of Lattice C, first announced for release back in November. The powerful package features an ANSI-standard compiler, every ST C library ever released, a library construction utility, the *WERCS* resource construction set, an assembler and the *MonST* debugger. Lattice C 5 costs £99.95 from HiSoft on 0525 718181.

NEW ST ACCOUNTS PACKAGE

Those of you who keep an eye on what's going on in the public domain may remember Graham Hutcheon's accounts program called *Double Sentry*, released over a year ago. Now it's been updated, enhanced and generally given the works and is available as a fully-featured commercial program.

Double Sentry is, as its somewhat excruciatingly punning title suggests, a double entry accounts program that is suited to home accounts and in particular the VAT-registered self-employed and small companies. It generates reports on nominal ledgers, purchase and sales ledgers, debtors and creditors and so on and so on.

What it can't do is to give you any very firm idea of how to do accounting. Still, *Double Sentry* and any of the numerous paperback guides available should give you a head start for the quarterly endurance test of preparing VAT returns.

DEMON MODEM ARRIVES

The Demon 4, it's called. It's from Modem Marketing, it's manufactured in the UK and perhaps not altogether surprisingly it's a modem. It's Hayes-compatible, it incorporates the Microcom Networking Protocol 4 (MNP 4) error correction system and the MNP data compression system and it offers speeds up to 2,400/2,400 bps – and up to a whacking great 4,800 baud using MNP 5. It automatically selects. the appropriate speed to handle data traffic. Built in power supply? Certainly. Battery back-up, enabling it to retain settings, commands and telephone numbers? Absolutely.

I'd get one if I were you. And you can: begin by talking to Modem Marketing about its new £299 Demon 4 on 0733 371388 (voice).

NEW ACCELERATOR AHEAD

I'm told that Dave Small is hard at work on a brilliant new project. Who's Dave Small, I hear you ask. He's the man – genius might not be too strong a word – who created the rather fantabulous Spectre GCR Macintosh emulator (until recently distributed in this country by HiSoft, and now by Ladbroke Computing on 0772 203166). And now he is hard at work on a 16MHz 68030 processor accelerator for the ST.

It's said to cost about the same as Spectre, too – under £500. It's not known how soon UK distribution will be arranged, but look out for the beast when it does. It'll sure as hell make your ST shift a bit!

MUDDLED ABOUT MIDI?

Most ST owners are by now somehow vaguely aware that their machine is the professional musician's choice. There can be few fully-equipped studios that don't have at least one ST cluttering up a desk somewhere – though, to be honest, it's more likely to be a Mega 4 than a 520 with single-sided drive.

But do you know why this is so? It's astonishingly simple, really: MIDI. Every single ST ever built features built-in MIDI in and out ports, and while the saving in expense is not sufficient to make the likes of Peter Gabriel and Fleetwood Mac pleased they bought Atari, the convenience sure is.

Still, there's much more to it than that. MIDI has opened up an enormous range of possibilities for the ST, as Jon Bates' series on music in this very publication recently demonstrated. Now you too can find out for yourself, with the relatively recent development of ST music training courses.

The latest is Micromagic, offering courses for the absolute beginner who wants to know how to get the musical most out of their ST.

Courses range from 12 weeks, at £448, sufficient to give you a complete grounding in the essentials, down to a week long course (£224), covering what I consider the most practical and interesting. There are two weekend courses, each priced £89.70. One is 'Recording Techniques', which looks at microphones, mixing desk effects and the use of multitrack tape recorders. The other, 'MIDI, Synthesis and Sequencing', offers training in the basics of sound synthesis and the different types of synthesiser available, as well as explaining the principles of MIDI and its applications.

Interested? You can find out more about Micromagic's music technology training by talking to Anita Hurst on 0924 410880.

MIDI MUSIC MAGAZINE

Somewhat cheaper than a whole weekend with Micromagic is an issue of *Music Matrix*, the MIDI disk magazine. Boss Lou Nisbet claims that the *Matrix* is the "best published source of MIDI tutorials in the BASIC languages."

What can you expect for your money? Well, issue 8, for example, includes a full working K1 editor, 50 new Korg M1 voices and 32 new Kawai K1 voices. Issue 9 has Alun Jones' new Roland D10 editor with all functions enabled and *Voice Databank* software (written, I note, in HiSoft Power BASIC), as well as two banks of 64 voices for the Roland D5. The latest issue, *Music Matrix* 10, has a Kawai K4 editor demo and samples for *Replay* 4 with editing software.

The Music Matrix costs £10 per issue from The Music Matrix, 14 Main St, East Wemyss, Fife KY1 4RU (phone: 0592 714887).

I HAVE A DREAM...

It must be said that for most of us Sound Technology's Sound Tools AT, which I briefly mentioned a fortnight ago, must remain a dream. I mean, we are talking two grand and upwards here, more than enough to pay off my Access bill. Indeed, I reckon this must be the most important development in music software/hardware in years.

So what's the big deal? The big deal is a stereo direct-to-disk recording and playback system with incredibly extensive editing effects and unbelievably powerful digital signal processing functions. This is the kind of kit that anyone involved in music creation using the ST would gladly kill for.

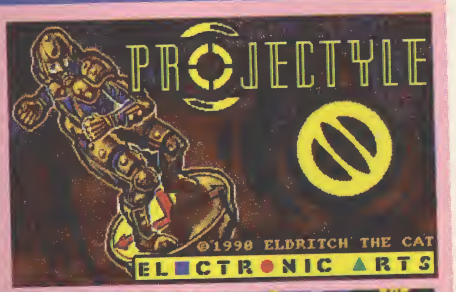
The only drawback – apart from the wallet-vacuuming price, of course – is the immense demands this technology makes on memory. Still, with the price of hard disk memory dropping like a stone this has to be the way forward. It's now possible, for instance, to buy a hard disk with over 100Mb for under £900, or a whacking great 250Mb drive for under two grand (both examples from Third Coast Technologies, 0257 472444).

Steve Carey

• *The Demon 4: one hell of a modem.*

ST GAME OF THE WEEK

PROJECTYLE



ELECTRONIC ARTS • £24.99

After a plethora of football simulators, the ball game has become positively hackneyed. Winning has become a simple matter of using the same joystick technique and growing accustomed to the speed of play. This latest game aims to change all that. Listening to programming team, Eldritch the Cat, talk about *Projectyle*, you realise that the game is a combination of such hits as *Speedball* and *Ballistix*. But with major differences in the design of the pitch and the control of the ball, don't expect it to be a slight variation on a common theme.

The avowed objective of the game is to compete in trials to win against eight opponents. These can be controlled by either computer or human. Each game is played out between three teams and in the event that three human opponents come up against each other, two players compete on joysticks and a third plays using the keyboard.

The pitch is split into five sections – a central arena leading off to four outer sections. Three of these four sections have a goalmouth for each player and the fourth section is appropriately called the frantic zone. In this area there is a goal for all three players. To score at the game you need to do your best to keep the ball out of your section. If it strays in then hang around the goal and wait to boot the ball out. In the frantic zone the action really hots up and goals can be scored over and over again.

The ball control in *Projectyle* is seriously manic. A click on the fire button sends you hurtling into the ball, while movements on the joystick produce only subtle changes in direction. As a result, there is often a sizeable amount of luck involved in winning the tournament. An ardent gamesters or a computer novice can be just as frightening opponents if luck is against you.

***Projectyle* features super-fast eight-directional scrolling which is a major achievement for the ST. A variety of different playing arenas makes each game different and with effective spot effects, it's remarkably absorbing. The element of luck involved can be frustrating at times but that doesn't stop this from being the most addictive ball game since *Speedball*.**

Mark Higham

BEST SHOPPING EXPRESS

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The *weekly* computer market place for people *serious* about buying

THIS WEEK'S BUYERS' GUIDE

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A comprehensive review of the best software for your machine

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THE SHOPPING EXPRESS GUIDE TO THE TOP WORD PROCESSORS

The most vital piece of computer software for most serious users is the word processor – many use their micro for nothing else. Here is the Express verdict on the best you can find for every machine

The most popular use for the micro is as a word processor. Its uses are many and everyone can benefit from it at one time or another.

Whether you intend to write to the *Times* as 'Angry of Pinner', write to thank Aunt Elspeth for the vellum bound copy of *Pilgrim's Progress* or send Jeffrey Archer running for the smelling salts with your latest thriller, a word processor is for you.

First things first, what is a word processor? It is an applications program that runs on your micro allowing you to use it as an intelligent typewriter. You can see the results of your typing before you print it and can correct mistakes, manipulate text and format documents on screen.

There's no need to print your document there and then, as it can be saved to cassette or disk and retrieved later for further additions, editing or printing.

The beauty of word processing is that you can set up and save commonly used layouts and letters and load them when needed to avoid repetitive typing.

Most word processors allow you to change margins and reformat text and any number of tab settings can be incorporated.

Common series of commands or keystrokes can be incorporated in macros in most word processors, allowing multiple commands at a single keypress. This is also useful for saving strings of text. Commonly used phrases, addresses and phone numbers can be assigned to a macro.

The more comprehensive (for which read 'more expensive') word processors generally have spelling checkers, mail merge facilities, word counters, and some of the better ones can even display italics, bold type face and different text sizes on the screen.

The ability to present the document on screen as it will appear on paper is known as WYSIWYG (What You See Is What You Get) and this feature is becoming 'standard' on new software.

To combine a letter with names and addresses in a database is called mail-merge and is especially useful to businesses who wish to send the same letter to different clients, or perhaps a student wanting to tailor a curriculum vitae to suit prospective employers.

Page numbering and titling can be handled by most programs, and some even allow footnotes, bibliographies and indexing to be incorporated.

As word processing becomes more advanced, features such as importing graphics, working on several documents at once and calling lists from databases increase the efficiency of a simple typist or a large multinational. We all need to write at some time, and the word-processor takes some of the drudgery out of the task.

This is the Express guide to the word processors available for each machine with a brief description of each. Prices shown include VAT.

PC WORD PROCESSORS

● KWORD 2
Kuma
£39.95

Budget-priced word processor with on-screen features such as bold and italic. Runs within GEM and can have up to four documents open in on-screen windows simultaneously.
0734 844335

● MANUSCRIPT 2.01
Lotus
£454.25

The heavyweight for the technical author. Not a general purpose WP. In a sense, it is more of a giant outline processor for imposing clear and flexible structures on complex documents. Handles cross-referencing, equation definition and tables. Imports Freelance and Graphwriter graphics and allows page previewing. Requires hard disk.
0753 32443

● MULTIMATE ADVANTAGE 2
Ashton Tate
£450

Primarily a secretarial package. Included are sophisticated mail merge functions, a card index database, a thesaurus and a 110,000- word spelling checker. Macros and line drawing possible. Choice of keyboard or menu control. Hard disk recommended.
0628 33123

● MULTIWRITER 2
Newstar
£114.95

Regarded as a relatively modestly priced WordStar clone, Multiwriter 2 offers macro learning and language facilities and can import WordStar, WordPerfect and Multimate files. Has mail merge, word counter and spelling checker.
0245 265017

● NEW WORD 2.18
Newstar
£114.95

Highly customisable and well respected WordStar-style WP with powerful mail merge, plus spelling checker and word counter. Uses the same keystrokes that WordStar enthusiasts know and love.
0245 265017

● OLITEXT PLUS 2.0
Olivetti
£355

A fast word processor with math and macro functions. Contains a pull-down notepad and calculator. WYSIWYG.
081-785 6666

● CELEBRITY
Software Paradise
£80.50

An unusually well implemented word processor for the beginner. Uncompromising attempt at a comprehensive suite of programs with a thesaurus, spell checker and the ability to open four text windows.
0222 887521

● PC WRITE 3.0
Sagesoft
£114.95

Footnotes, contents, mailmerge, multi-column, and other features make this under a hundred good value. Runs a little slow at times but is a good middle of the road program.
091 213155

● PROTEXT
Arnor
£100

Widely respected, not least among journalists, Protext stands out for its abilities in text and file handling. Built-in mail merge facilities are so powerful that it forms programs of its own. Choice of prompted word commands or menu system. Spelling checker; editable printer drivers.
0733 68909

● SPRINT 1.01
Borland
£172.50

An unusual and innovative package. Has drawbacks, including not being WYSIWYG, but offers emulations of common WP user interfaces (including WordPerfect, WordStar and Microsoft Word) plus full programming language for writing your own. Allows up to six windows on 24 documents. Saves changes while you type!
0734 320022

● SUPERWRITER 1.03
Computer Associates
£224

A fairly simple to use well functioned word processor with mail merge and spell checking facilities.
0753 77733

● TASWORD PC 1.17
Tasman
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Dead simple and cheap enough but damn slow. A domestic solution to a commercial problem.
0532 438301

➤

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0453 753944

● WORD 5.0

Microsoft
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A very good, sophisticated heavyweight word processor with excellent outliner.plus style sheets, maths, macros, and up to eight windows on the screen at any one time.
0734 500741

● WORDPERFECT 5.1

Word Perfect UK
£494.50

Not cheap, but this top-selling WP is generally regarded as superb. Lacks outlining, but among numerous attractive features are thtree-level undo facility, graphics importing and editing, macro facilities and on-screen columns.OS/2 version costs £575.
0932 850500

● WORDSTAR PROFESSIONAL 5

Micropro
£399

Years ago it became the 'standard word processor'. It has many features, and 'WordStar' keystrokes are the standard by which all other packages are judged. Version 5 offers an improved interface. It is a pity that such a popular package is still seriously flawed.
081-643 8666

● WRITER 1295

Logotron
£12.95

The low price of this budget software more than makes up for the snail's pace of its spelling checker.
071-359 3594

AMIGA WORD PROCESSORS

● PROTEXT

Arnor
£99.95

Protext is an easy to learn word processor with powerful text handling and file manipulation. The mail merge facilities are so comprehensive that you can look on the stored commands as a programming language for mail housekeeping. A good spelling checker and available on many other machines.
0733 68909.

● KIND WORDS 2

Amiga Centre Scotland
£49.95

Seemingly good value word processor for under fifty quid. Spell checker included and also the ability to import graphics. The current version includes A dictionary, thesaurus and various fonts. If you intend to upgrade to DTP, it's worth seriously considering contacting HB Marketing on 0753 686000 who include Kind Words in their 'Publisher's Choice' DTP package at under £100.
031-557 4242

● SCRIBBLE (PLATINUM EDITION)

HB Marketing
£49.95

The updated and upgraded version of the already popular *Scribble* . Very simple to use and with a spelling checker and mail merge facility. Text can be reformatted as you type. No graphic functions but very simple to use.
0753 686000

● WORDPERFECT

WordPerfect UK
£293.25

WordPerfect is a full featured heavyweight word processor with a price to match. This almost £300 package includes over 500 pages of manual and a huge dictionary /spelling checker/thesaurus. A Command line interpreter can be called from within the program simplifying the running of multiple environments.
0932 850500

ST WORD PROCESSORS

● FIRST WORD PLUS 3

Electric Distribution
£79.95

First Word comes bundled with the ST and for that reason, First Word Plus makes a logical upgrade with its ability to handle graphics and capture screens directly in the Degas format. Many good features such as column printing, mail merge, and a spelling checker, but the operation can be tedious. The current version contains a well specified index.
0480 496789

● WORD WRITER 1.0

Electric Distribution.
£49.95

What you see is what you get (WYSIWYG) The spelling, merging and thesaurus of this program are well integrated and all in all the program is easy to use. There are user definable routines and an intuitive typist will soon come to grips with it. There is no graphic importation facility and combining layouts in the same document is awkward.
0480 496789

● PROTEXT

Arnor
£99.95

Protext turns up on all of the popular machines and for sheer ability at handling text and files, takes a lot of beating. The same things that apply to the Amiga version, also apply to the ST Fully keyboard driven, ST Protext kicks the GEM environment out in favour of its own.
0773 68909

➤

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● THAT'S WRITE

Cavendish
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This popular program puts the emphasis on the printed word and produces excellent hard copy. You can design a font, grab a screen or utilise the auto-indexing feature. There are many unique features but the manual is quirky and the WYSIWYG display has some weird fonts on screen.
071-323 4761

● WORDUP

HB Marketing
£59.95

More a document processor than a word processor, Wordup is the first step toward DTP having features such as graphics, text flow, graphic import, type sizes and styles. Ideal for producing newsletters and impressive documents. Unfortunately, there is no way of importing other fonts and a spelling checker is noticeable by its absence
0753 686000

PCW WORD PROCESSORS

● LOCOSCRIPT 2

Locomotive Software
£25 including p&p

LocoScript 1 is bundled with the PCW8256 and 8512. LocoScript 2 comes free with the PCW 9512. Therefore the obvious upgrade for all PCW 8256 and 8512 owners who want a little more speed and support for foreign character sets is LocoScript 2. They still haven't remembered the word counter and it still works at the speed of a snail in reverse but some people cut their teeth on Locoscript and will probably like it.

Strange that Locoscript 2, with all its fonts and foreign symbols and graphics abilities, is bundled with a computer with a daisywheel printer that has no need or use for it.
0306 740606

● PROTEXT

Arnor
£59.95

Protext PCW works under CP/M and is mobile between PCW and CPC computers (The same disk works in both, honest!). A stalwart user of Locoscript may grumble for a few seconds but the lightning fast file handling will soon produce another convert. Mail merging, column printing, two file editing and with an in-built spell checker. Using the M: drive it becomes faster than a speeding bullet.

If you own a PCW and you haven't got this program, you are wasting your machine's potential.
0733 68909

● MINI OFFICE

Database
£30.00

Mini Office is a five-piece applications package of which the word processor is just one part. If you only type the occasional letter, want to store the family finances in a spreadsheet and catalogue your records in a database, buy it. If you have serious word processing in mind, it is probably not your best choice.
0625 878888 or 051-357 2961

● NEWWORD

Newtar
£70

A WordStar clone for people who were trained on that standard word processor and are unwilling to change. Flexible and powerful, but probably best left to those addicted to the original it is based on.
0245 265017

CPC WORD PROCESSORS

● PROTEXT

Arnor
£19.95 Tape
£26.95 Disk
£39.95 Rom

It is worth buying a Romboard and Protext, for the sheer enjoyment of instant loading non-memory-resident software. A couple of keystrokes and the program's there. No waiting around while tapes chunder or disks whirr. File size is limited to 22K (disk version) or 38K (ROM Version) but 38K is plenty long for a chapter of a book, so it isn't a real restriction .A straw poll of the journalists on Amstrad Action revealed that they were all using Protext on ROM. Enough said.
0733 68909

● MINI OFFICE 2

£14.95 Tape
£19.95 Disk

Part of the five-piece applications suite, the word processor is OK for the occasional letter but not really a contender for the hard work stakes.Bundled with database, spreadsheet, graphics and comms, it is very good value for fifteen quid, but only for occasional use.
0625 878888

● TASWORD

Tasman
£19.95 Tape
£24.95 Disk

Different versions for the 464, 664, and 6128 use the machine's features to the best advantage. The disk versions include a mail merger, and printer control is easy. An easy to drive program with a slightly slow text-handling ability but nonetheless, excellent value. A separate menu customises the program to run to your specification.
0532 438301

● BRUNWORD

Brunning Software
£30 6128 disk
£25 464 disk

A word processor, spelling checker and card filer that work in 40, 80, and 128 column modes. This excellent program is easy to learn, good value and just sneaks past Tasword as second in the CPC stakes. This one would be ideal for a small club or society who wanted to update their membership using a simple data filing system.

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C64 WORD PROCESSORS

● EASY SCRIPT
£50
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It's a good all round word processor that's no longer in production. Mail order houses are your best bet to find it. It only works in 40 column mode but has many features and is easy to drive. Good Value.

● PAPERCLIP
£50
Mail Order Only

This is reckoned to be the best C64 word processor around. It can work in 40 or 80 column mode, has a spelling checker and the facility to write your own macros. Two document working is supported and the only thing going against it is its lack of suppliers. Difficult to find but worth the effort.

SPECTRUM WPs

● TASWORD
Tasman Software
£13.95 Plus 2
£19.95 Plus 3

The only serious contender in the Spectrum market for a long time was Tasword. Tasman has catered for each different machine by producing different machine specific versions for 48 and 128K Spectrums and with tape and disk versions available. It runs very slowly at times, but puts the Spectrum firmly on the word processing map and has options to customise and speed up the routines. Plenty of help on screen and mail merging as well.
0532 438301

● RAM WRITE/RAM PRINT
Datel Electronics
£34.99

The RAM Write/RAM Print add on cartridge for the Spectrum is a ROM based word processor and printer driver which attaches to the expansion port and as well as giving the Spectrum user an instant word processor from its inbuilt EPROM, it also has a joystick port to allow the demise of a few aliens after a hard session of word-smithery. As it only lives on a 16K ROM which contains a parallel printer driver as well, it isn't as well specified as Tasword, but for pure convenience of use has to be a bargain.
0782 744707.

BBC WORD PROCESSORS

● WORDWISE PLUS
£56.35
Computer Concepts

An early offering for the Beeb that works in 40 column mode. 80 columns can be seen in preview mode. Very quick and intuitive.Plenty of help in the manual and a facility for embedded print codes, but be prepared to work at it. Macros are supported, and it is also available in the instant-load ROM format.
0442 63933

● INTERWORD
£56.35
Computer Concepts

Part of the 'Inter' integrated suite of programs. An easy to use 80 column word processor with spelling checker. ROM versions of the whole 'Inter' range available.
0442 63933

● VIEW 3
MicroPower
£44.95

This ROM-only 80 column word processor limits the size of document that you can use, but is nonetheless easy to use and functional.
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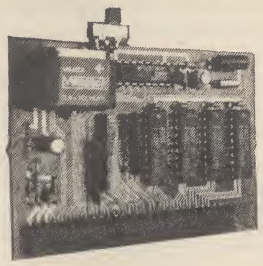

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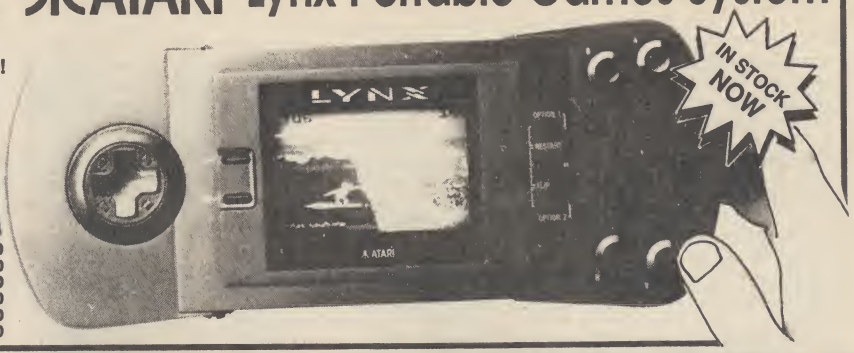

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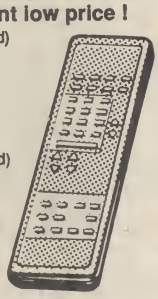

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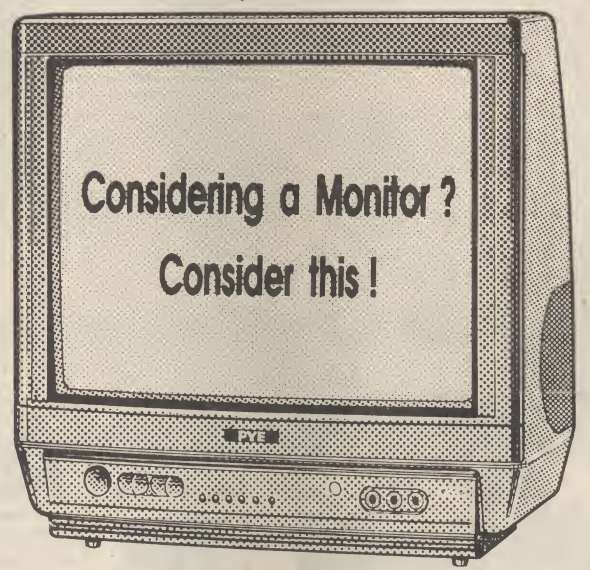

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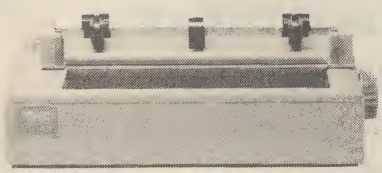

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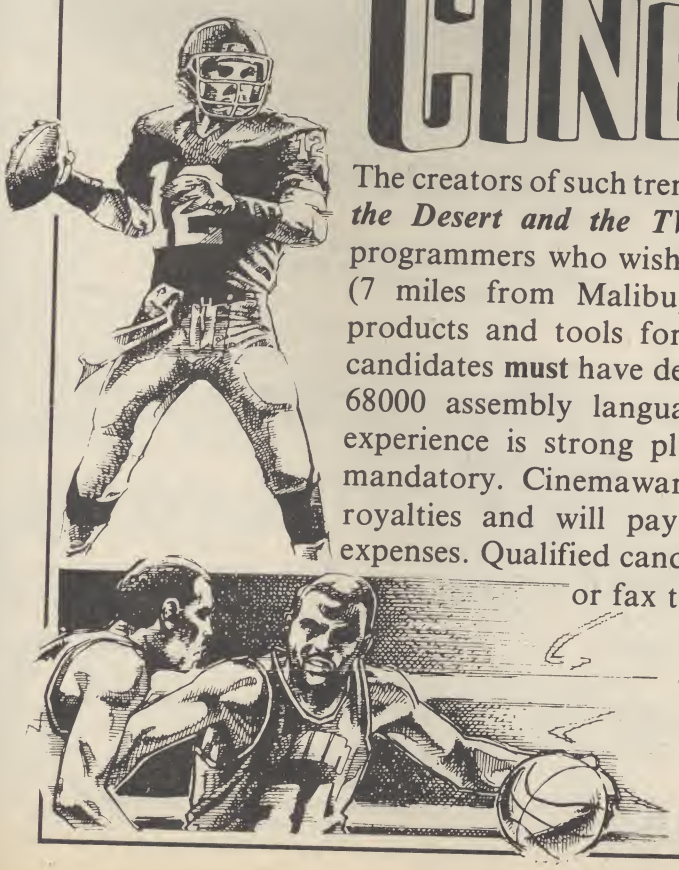

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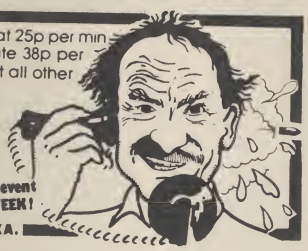

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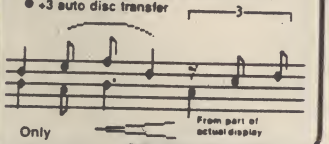

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THE PD COLUMN

There is a lot of software out there available for the price of a disk. Our weekly column by Jerry Glenwright explores the world of the public domain.

The United Amstrad User Group wishes to make it known that it can supply up to 6Mb of free software entirely, utterly and completely free.

That's right, not even the price of the copying. Simply send the group a disk and it will respond with by filling it full of programs.

And there's provision for cassette owners too. If you're a cassette owner who's feeling left out in the cold, then warm to the fact that the UAUG will, upon application, send you a tape stuffed to the gills with goodies. You simply copy the tape then return it intact and you won't incur any charges – can't say fairer than that.

What's that? The group's address? 26 Uplands Crescent, Fareham, Hants PO16 7JY. Telephone 0329 234291.

Oh no! There's another 'small man' library tugging at my typing fingers, just crying out to be in (and if you're not in you're out). Alan Scully produces – alongside Robot PD (details in a coming installment) – the only entirely cassette-based CPC PD library.

The man Scully has included his CPD-8 Starter Pack cassette to substantiate his outrageous claims. These latter prove to be entirely stantiated and so he gets a mention. Alan Scully, 119 Laurel Drive, Greenhills, East Kilbride, Glasgow G7S 9JG. The price? An unbelievable cheap 40p per disk! And so on to this week's column...

AMSTRAD CPC

D-Shell is a quite remarkable friendly front-end for Amstrad CPC owners whose systems are equipped with disk drives.

Normally after buying an Amstrad disk drive, new owners are quickly dismayed by the dreadful Amstrad DOS (Disk Operating System) which accompanies the device.

To rename a file, access a binary file or delete an item, you must type a serious of obscure commands from within Amstrad BASIC, whereupon the drive is accessed and DOS is loaded together with whatever command you've chosen to issue. The process is extremely slow and highly inefficient.

D-Shell overcomes the limitations set by Amstrad DOS by providing an efficient shell to front DOS. When you boot the Amstrad, *D-Shell* is loaded from disk and hidden away as a tiny fragment of binary code in a protected reset-proof portion of memory. Now when you want to rename, delete or otherwise manipulate files and programs stored on disk, you simply type 'D-Shell' at the BASIC prompt.

A menu appears on screen providing all of the most needed disk and file options. Each command is selected by typing its first letter. If you need to specify parameters such as selecting a particular file, then you're prompted by *D-Shell*.

Lightning fast operation (due to its being held in memory at all times) makes *D-Shell* a really necessary improvement over the existing DOS, and once used, you'll never want to be without it.

ATARI 8-BIT

Several word processors have appeared for the Atari 8-bit over the years, most emanating from the United States, and although one or two have been rather good, they're invariably expensive and never seem to offer all the options you require. And being commercial offerings, there's no way to customise them to your own specifications. But there is an alternative.

Speed Script from Compute! is a word processor with a difference, you type it in! That's right, originally appearing in printed form in the incredibly popular American computer magazine

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SENAT58 Snowman Demo (1 meg)
SENAT62 Pipemania Demo
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SENAT64 DCFormat, Wakeicon, etc
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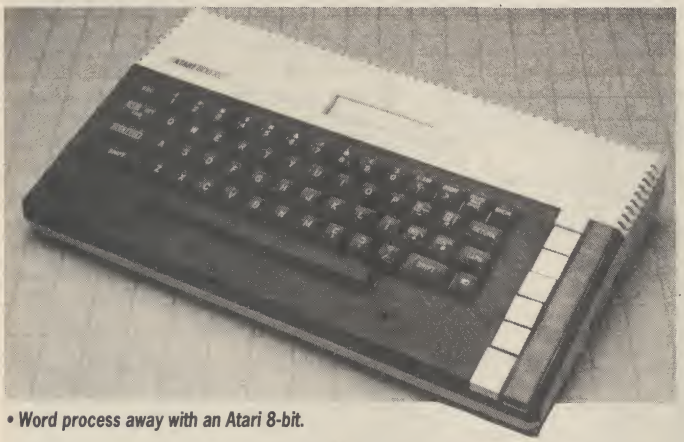

• *Word process away with an Atari 8-bit.*

Compute!, the program proved to be so popular (for the Apple, Commodore and other machines too), that *Compute!* Publications decided to release the program in book format.

Available from most good High Street book stores, the *Speed Script* book contains the full source code. Worried about typing it all in? Worry not, for included in the book is a little monitor program which tells you if you make a typing error.

The general consensus is that typing it in takes about two evenings – no problem considering the quality of the Atari's excellent keyboard.

Once up and running, *Speed Script* really is a program to be reckoned with. Every possible editing, and processing feature you can think of is included in the program and quite a few you probably hadn't thought of.

And of course, if you don't like something, then using the annotated listing, it's a simple matter to change the bits of the program you don't like or to add specialised features needed by yourself.

Speed Script by Charles Brannon takes up only 8K of valuable RAM memory, costs under a tenner and is published by *Compute!* Publications (ISBN 0-87455-003-3). If you're serious about word processing, get a copy today! ■

WHERE TO GO...

Many PD libraries advertise in Shopping Express, but these are also worth a look.

ATARI ST

• Goodman Enterprises, 16 Conrad Close, Meir Hay Estate, Longton, Stoke-on-Trent ST3 1SW. The Goodman library is one of the best, with all the latest PD always in stock – and Mike Goodman is a friendly guy, always willing to chat!

• Page 6, PO Box 54, Stafford ST16 1DR. Page was one of the first PD libraries and ranks with the best. The company also stocks a wide range of Atari 8-bit PD.

CP/M

• The CP/M User Group, 72 Mill Road, Hawley, Kent DA2 7RZ. Help, advice and more PD than you can shake a stick at.

COMMODORE AMIGA

• George Thompson Associates, Dippen, Brodick, Aran,Scotland KA27 8RN. GTA stocks a variety of products for Commodore's baby and has an excellent PD library.

• Softville PD Service, Unit 5, Stratfield Park, Elettra Avenue, Waterlooville, Hampshire PO7 7XN. A comprehensive library which also stocks ST and PC PD too.

AMSTRAD CPC

• Wacci UK, 9 South Close, Twickenham TW2 5JE. Bung a couple quid in the post for a latest copy of the *Wacci* fanzine (a very good read...) plus comprehensive lists of PD.

• DW Software, 62 Lascelles Avenue, Withernsea, North Humberside HU19 2EB. The source of Desk and many other remarkable PD programs all written by DW himself!

PC AND COMPATIBLES

• Public Domain Software Library, Winscombe House, Beacon Road, Crowborough, Sussex TN6 1UL. The first in the UK.

• Seltec Computer Products LTD, Northumberland House, Staines Business Centre, Gresham Road, Staines, Middlesex TW18 2AP. Seltec stock a large range of quality shareware.

APPLE MAC

• The Macintosh User Group UK, 55 Linkside Avenue, Oxford OX2 8JE. A users group? Yes! PD library? Yes!

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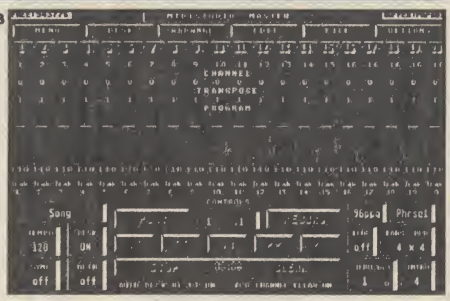

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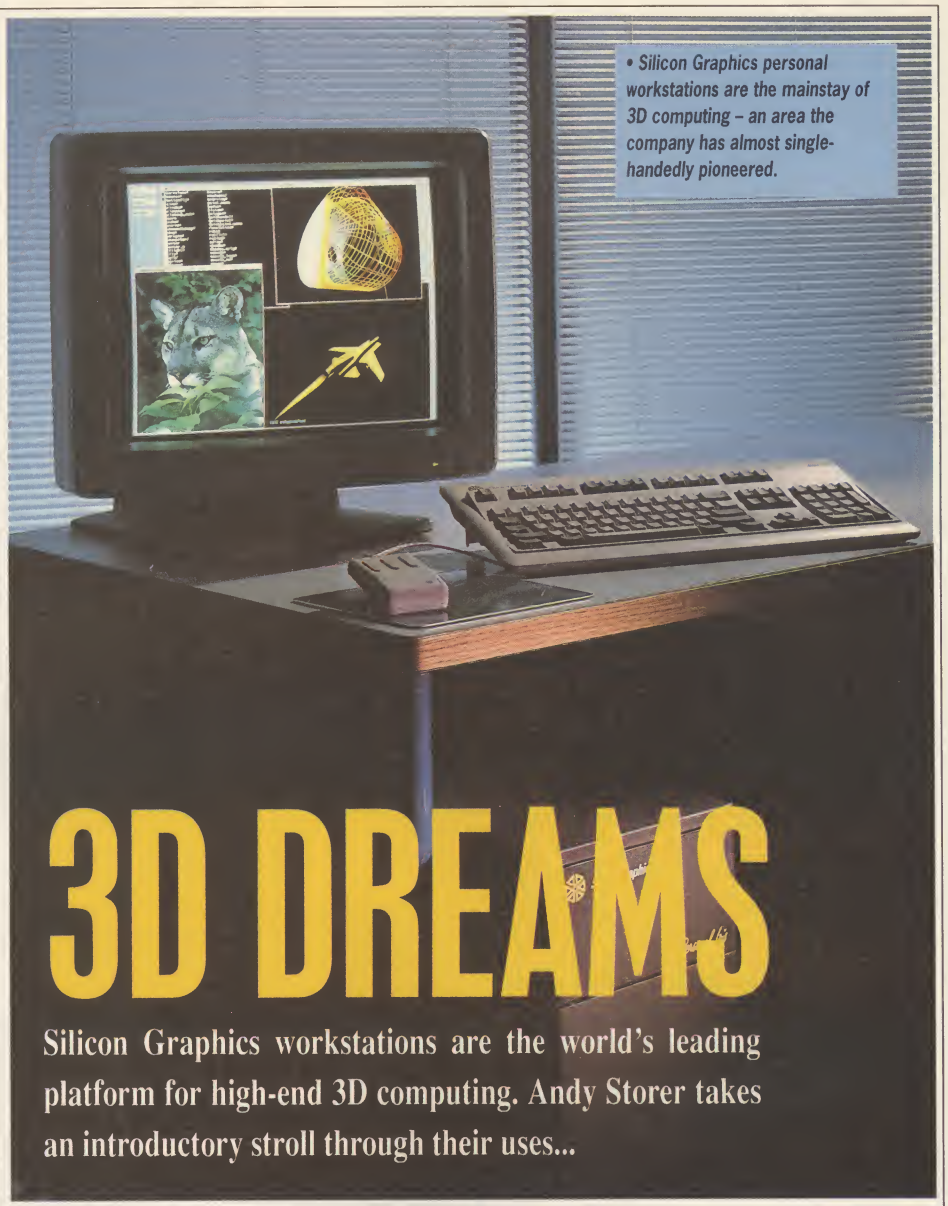


• *Silicon Graphics personal workstations are the mainstay of 3D computing – an area the company has almost single-handedly pioneered.*

3D DREAMS

Silicon Graphics workstations are the world's leading platform for high-end 3D computing. Andy Storer takes an introductory stroll through their uses...

Three-dimensional computing was born in 1981. Before then, even the most massive of mainframes only handled 2D drafting. It took a revolution spurred by Silicon Graphics to present designers with opportunities to smoothly simulate solid or surface images in real-time.

This was essential in so far as engineers and manufacturers required cost-effective means of translating 2D plans directly into 3D prototype modelling instructions. It took three years for the first products to ship, but only another three before the company could claim to be the world leader. Nowadays, Silicon Graphics Iris workstations, starting out at £25,000, dominate every area of sophisticated 3D visualisation – whether it be cars, TV adverts or robots.

Its latest beast, the Power 4D-200 uses eight RISC chips delivering a claimed 33 megaFLOPS (million floating point operations per second, an Amiga manages about a hundredth of that); enough performance to handle more than one million polygons per second. This sort of power means that engineers and designers can, for the first time, manipulate full-rendered objects in real-time.

As it can also display images with up to 268 bits (roughly 5 x 10^{80} colours) per pixel you won't be surprised that it costs $100,000 – but then Silicon Graphics would argue that's a tenth of the price of competing systems from Cray and IBM. So how do you go about harnessing all that raw power?

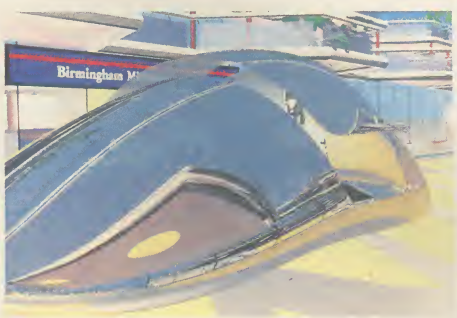
AT THE 3D HEART

A 3D graphics workstation produces smooth, solid, animated objects by keeping a database of all the co-ordinates of the graphic components and their relationships to each other. This takes huge amounts of computation – the latest machines use up to eight CPUs simultaneously and process data at rates of up to 1.35 billion bits each second! But how do you convert the sketchy dreams of designers into the primitive streams of binary a computer requires?

After a project brief is established, visual ideas can be entered directly into the workstation using a graphics tablet and light pen. More often than not though, the visual ideas come in the form of artwork and models produced by artists. 2D artwork is placed on a digitising tablet and the outlines traced using an electronic stylus, and 3D objects can also be traced using sophisticated 3D digitisers from companies like Cyberware.

DIGITISED DATA

Other material such as live action or hand animation is frame grabbed, while computer generated effects, such as landscapes, clouds and water, can be created using complex fractal maths. The digitised data is first reproduced in wire-frame form, allowing images to be manipulated at 25 frames per second – real-time – thus making the process fully interactive. Motion rates, point of view and light placement can all be manipulated using a sophisticated modelling language. Animated sequences are constructed using the traditional key-frame process whereby all the in-between frames of a movement are automatically worked up by the software.



• *With 'environment mapping' it's possible to create a convincing illusion of fully reflective surfaces like mirrors, chrome, ceramics and precious metals – other material qualities such as transparency and translucency can also be rendered.*

SAMPLE RENDERING

A selection of single frame images are fully rendered in order to give an early impression of colour and lighting. The rendering system can produce the standard 'face shading' of simulating flat matt surfaces and 'phong shading' – a method for representing shiny smooth surfaced objects – but there are a host of other features available.

'Texture mapping' allows any 2D colour image from any source to be warped and pasted onto the surface of an object, while 'bump mapping' is used to simulate tactile qualities such as wrinkled or rough surfaces like granite or embossed paper.

In addition to simulating natural light sources, the software can provide a wide variety of artificial illumination effects, including variable beam spotlights, lamps of different colour and brightness, and glow effects. Combine these with the ability to produce varying shadows, soft rendering and selective ray tracing, and you have a graphics manipulation system where the only limit is imagination.

Finally, all frames in an animation are fully-rendered and light-sourced and the sequence is ready for presentation. ■

CYBERWARE

Besides requiring 3D digitisers to scan objects into the graphics workstation for manipulation, manufacturers are also likely to want real solid 3D output too – actual models they can hold. One company which can deliver both is Californian-based Cyberware. It claims its 3D Digitiser can scan the shape, colour and texture of a complex 3D object in less than 15 seconds for display on screen as a detailed, full-colour 3D model. Once in position the model can be altered at will and the results sent to a milling machine for rapid prototyping. So, for instance, an engineer could evaluate a new aerodynamic surface in a wind tunnel, modify it on a workstation, then mill a new prototype – all in a matter of hours. More info on 010 1 408 373 1441.

THE OUTER LIMITS

ASA is right at the cutting edge of 3D computing. It used Silicon Graphics and Cray computers in the design of the space shuttle to handle its thermal dynamics. As much as 32Mb of data would need to be computed for one second of flight time – the human equivalent of assimilating a numerical report some 11 feet high. A Cray X/MP handled the number-crunching and downloaded the data to an Iris workstation to provide the 3D visualisations.

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TEXT PROCESSOR

The Portfolio's built-in text processor program includes word wrap, line and column count, string search, in fact most of the functions you would find in a word processor. It handles printer and word processor control codes and allows easy transfer of files between Portfolio and your desktop PC.

SPREADSHEET

For real calculating power, Portfolio has a Lotus 1-2-3 compatible spreadsheet built-in. It has 127 columns x 225 rows and reads/writes Lotus V1.0 and V2.01 files, so you can transfer data to and from Lotus 1-2-3 on your desktop PC. The Portfolio's 256K ROM includes MS-DOS and PC BIOS compatible systems software.

MEMORY CARDS

Portfolio can store and retrieve data and programs from its own RAM, or from small credit card size memory cards, that slot into its built-in card drive. The cards are available in three sizes, 32K, 64K and 128K, so you can carry a library of data in your pocket. The card drive also accepts ROM cards, which can contain commercial or custom software.

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Portfolio can communicate with other computers and supports a growing range of peripherals via a built-in 60 pin bus connector. Peripherals available include serial and parallel interfaces and memory expanders (to 640K). You can also add a card drive to your desktop PC, to enable it to read/write to Portfolio's cards.

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GEO GRAPHICS

It's the fastest, loudest, and most expensive console ever. It's the Neo-Geo, and Tony Takoushi can't take his hands off it...

•Neo Geo: the 'home arcade' game everyone's waiting for

The Neo-Geo from SNK represents something of a quantum leap in the world of home video consoles. The new machine is simply miles ahead of the competition in terms of its hardware, software and, inevitably, its price.

SNK has a strong background in arcade shoot-'em-ups, with *Time Soldiers, Ikari Warriors* and *Contra* to its credit, to name but three. It is this expertise – not least the hardware technology – which the company has repackaged for the home in the shape of the Neo-Geo.

INSIDE

At the heart of the system is a Motorola 68000 processor running at 12MHz – that's 50 per cent faster than its working speed in either the ST or Amiga. A Z80A co-processor (which is a whole CPC or Spectrum's worth) runs at 4MHz to control the sound

The machine boasts 64K of RAM, 68K video RAM and 64K of ROM. There is a palette of 65,535 colours with up to 4,096 on screen at once. SNK has developed its own custom, large scale integration, video display processor and has built in hardware sprites and hardware scrolling.

Sound comes from three programmable sound generators, four FM channels, one noise channel and seven pulse code modulation channels. This is a formidable sound line-up, which becomes evident during play – digitised sound is littered throughout the game and music beats away wildly without any need to slow up for the on-screen action.

OUTSIDE

The beast itself is a sleek black plastic 30cm by 25cm rectangle 5cm deep. Two 15-pin D-shaped joystick ports share the front surface with on/off and volume sliders, headphone socket and memory card port (see below). Games cartridges fit into a large slot on top of the machine and measure 19cm x 12cm x 3cm. Each cartridge contains two boards (which probably accounts for the enormous 46Mb capacity) and fitting one snugly into the console can be unnerving.

To the rear are ports for audio and video out, and the absence of any expansion ports or buses suggests that SNK has no plans beyond pitching the Neo-Geo firmly at the arcade-playing market.

The joypad has certainly not been skimped on – it measures 28cm x 18cm x 4cm, which is not far off the size of the console itself. It sits comfortably in the lap, and both the joystick and buttons have a good, solid throw and play smoothly.

£120 A GAME

The new console was released in Japan during April at a retail price of 58,000 yen (around £260). Titles already out include *Mah Jong, Magician Lord, NAM-1975, Baseball Stars* and *Top Players Golf*. Each game costs 28,000 yen, a staggering £120 to you and me.

As is evident, the Neo-Geo is not the cheapest of consoles in itself, and its software comes in with a price tag around four times higher than that on a typical Megadrive/Master System cartridge. But can this huge outlay conceivably be justified by the quality of the games on offer?

If all of the software matches the standards of *Magician Lord,* which came with the machine, then on balance the short answer is yes. This is a game that has everything an arcade fan could possibly want from an adventure (see the review on this page), but you would still have to be a very big fan to part with this kind of money for one game.

As far as the man in the street is concerned there is limited potential demand for such expensive software.So it is worth looking at just where the Neo-Geo is going to find its niche in the market.

HOME ARCADE

The likeliest possibility, believe it or not, is that it will be mainly a machine to be hired out for a few days at a time, with only the most fanatical (and rich) games players actually buying one.

This is very much the pitch in Japan, where taking out the Home Rental System (as it is labelled there) is regarded as hiring an arcade machine for the weekend. But the idea of the Neo-Geo effectively being an arcade machine in a smaller box is far from fanciful. The same games will run on both systems, and a unique feature is the ability to save your game position from the console and resume the game in an arcade machine or vice versa.

This is done via a 2K smart card, included in the console package, which can be inserted into a slot in the new generation of SNK arcade machines. The first coin-op to feature this is *NAM-1975* which arrived in the UK during May, so SNK can certainly not be accused of dragging its heels on making sure the technology is in place for the console's launch.

The Neo-Geo will receive a limited release during the last quarter of the year and is officially on display at the EMAP September show both on the Degaulle Marketing stand and in a special exhibit called The Living Room of the Future. ■

PLAYING THE GAME – MAGICIAN LORD

Boot up the console and there's a fair bit of rigmarole before the game gets under way: Neo-Geo logo, copyright screen, title screen, attract mode with high score table, option to start from a position saved to memory card, split-screen tutorial, and at last...

But not yet! Next a transformation screen for powering up your choice from Shinobi, Dragon Warrior, Waterman, Poseidon Samurai and Raijin superbeings with their different weapons and special characteristics.

At last, the game. The first impression is of something very special going on. The graphics are stunningly detailed and coloured (100-plus colours) and there are three levels of full-screen, pixel-smooth scroll.

There's a pulse-racing background rock track with digitised ooomphs, slashes and other sound effects to match the action and scenery as you climb around scaffolding, avoiding bullets and nasties.

The aliens certainly look vicious enough. Some have extended, ripping claws; others include blobby oysters that lob painfully slow floating bombs and ghost-like gods that pop out of holes. But the worst are hovering angels that fire homing bombs – these are very bad news indeed.

Fighting back means leaping and firing in all directions and if your character captures a transformation ball it metamorphoses into a Dragon Warrior breathing clouds of fire – gorgeous!

Other interesting features include funky, walking zombies and a gloriously cascading waterfall.

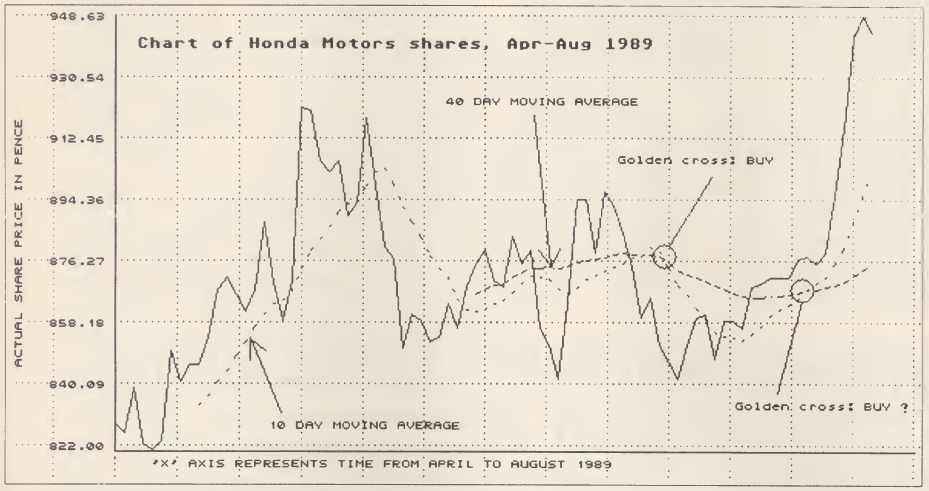
Eventually there is a cast iron door in a clifftop which opens with a satisfyingly eerie creak. Once underground characters can pick up jewels and health power-ups. There is a Shinobi capsule which adds twirling fireballs on the way to the level one antechamber, where the shield guardian has to be beaten before taking on the boss.

There's a brief interlude before being led into the boss' chamber where spikes (and superb graphics) fall from above and a face at the far end crumbles away to reveal a shell. This houses the vital organs of the adversary which have to be blasted to bits while avoiding its flame attacks.

Success means level two! Here, the graphics get better, the tunes wilder and the depth and action heavier. SNK games provide arcade-quality graphics, sound and depth of play. And there are six levels to go...

SHARE AND SHARE ALIKE

Stock Market share analysis has come to the ST with ProShare-ST. Chris McCowan speculates on the potential profits to be gained...



• Proshare's *graphical displays make the changes in share values instantly obvious.*

The era of high-risk, quick-turnover dealings of stripy-shirted youngsters has largely given way these days to the middle-of-the-road investor looking for an interesting hobby with financial rewards, and the serious investor with sizeable assets looking to secure the future.

The number of ordinary people who use the Stock Market is growing significantly and, with more than 7,000 stocks and shares listed on the Stock Exchange at a total value of £1,250 billion, an ST share management package is long overdue.

ProShare-ST aims to make problems with stock market dealing and monitoring a thing of the past. It consists of two parts, the Portfolio and History files – the two fundamental requirements for any investor. The first enables you to record up to 2,500 buying or selling transactions in any one file; the second keeps a day-to-day record of prices.

KEEPING TRACK

The Portfolio files provide you with simple dialogue boxes for you to edit and update your list of stocks. There is the facility to add extra payments, such as dividends, and a sophisticated search and select option based on quantities, profit margins and dates of purchase. You can sort or rearrange your transactions either manually or automatically. A criticism here is that it would be have been useful for the file to have kept a note of the quantity and value of shares remaining for those who wish to sell half their holdings when they reach the desired minimum profit margin.

The History files enable you to collate the complete list of *FT* indices. You also have the option to create a file, just selecting those companies you wish to monitor. Copies of *The FT, Telegraph* or access to teletext (Ceefax, Prestel or Oracle) is all you need. You can have up to 50 companies in each file if you have a 520ST, 100 if you have a 1040, and up to 365 prices per company, if you are fortunate enough to hire a slave for your daily updates!

This list of daily prices may be viewed through a sub-window opened through the History menu, or simply by double-clicking the mouse on the name of the company whose prices you wish to view. You can open five sub-windows at any one time. Altering and amending prices is simplified with a dialogue box offering choices of Value, Date, Rise and Fall.

Whichever publication you decide to subscribe to it is vital that you enter the company names in an identical order to avoid confusion. The sorting function in the History menu enables you to make sure you are conforming, should your list have inadvertently become misaligned.

RISE AND FALL

Part of the fascination of owning shares is to watch how they move and follow their rises and falls. Because individual shares do not move in isolation, it is useful to keep an eye on what the market is doing as a whole, so you can take action if you notice any sharp fluctuations in your holdings. The *FT*/SE100, or Footsie for short, is the most useful gauge – if your shares are bucking the trend then something is wrong. *ProShare-ST* enables you to monitor the performance of your shares at a glance through price lists and charts, and to make comparisons with similar companies.

The Chart and Graph facility is the most useful and addictive part of the program, especially if you prefer visually presented data, and can compare up to five companies at one time. There is a wide range of editing features available: colour changing, re-scaling, choice of background grids, type of graph format – bar and line, pie, stacked bar – even the option to show points and annotate the graph.

Plotting a point and figure chart enables you to see at a glance when your shares move. You can set up a designated profit margin in advance so that, if they do move beyond that point, you know it's time to sell!

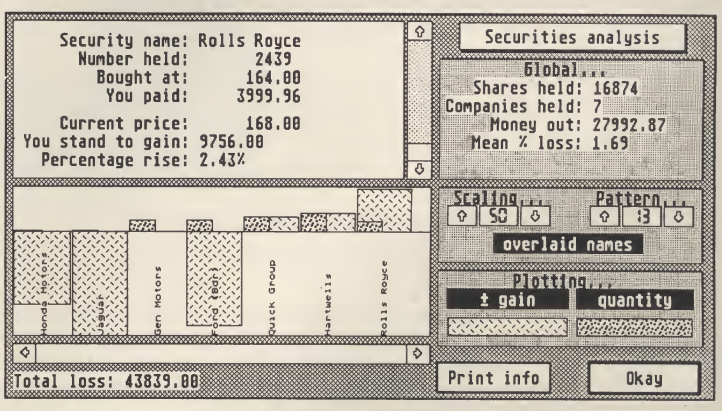
Select the 'Show information' option and *ProShare* will automatically chart each individual company on your list for you, together with the current, minimum and maximum prices. Plotting moving averages is yet another task made simple and *ProShare* also allows you to 'export' relevant data to other programs, incorporating your portfolio into a yearly balance sheet, or showing past performances of investments on a spreadsheet.

Rather like the 22 programs offered on washing machines, you find yourself using only a small percentage of the features. However *ProShare* is certainly geared up for use by the small investor who simply wants to organise their small portfolio, the small client-investment manager who would make use of the very comprehensive options available, or the small stock broker who wants to computerise his or her business cheaply.

But there's one area where *Proshare-ST* really can score. It is perfect for the legions of small groups which meet regularly to invest small sums on the Market. It can provide an ideal monitoring medium with facilities to print out information for all members – and should add a new dimension to the otherwise onerous task of group treasurer.

At just under £50, TC Developments has certainly aimed to give maximum value and flexibility in this neat and tidy package. ■

Proshare-ST *is available from TC Developments on 0937 61145 at £49.95. It runs on all STs, but a mono monitor is preferable.*



• *Instant updates on your portfolio let you keep track of your investments.*

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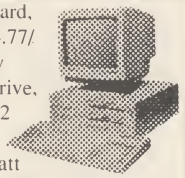

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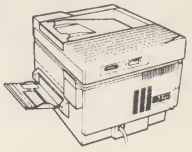

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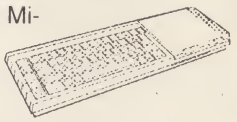

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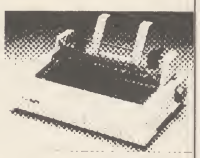

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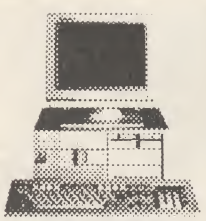

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THE TOOLS TO DO THE JOB

It's easy to clutter up your PC's hard disk with dozens of handy utilities for disk maintenance and the like. Stuart Anderton investigates a package which combines them all into one...

The IBM PC is a fiddler's paradise. Everything, from the basic hardware design to the range of memory-resident utilities, offers endless scope, and it's perfectly possible to tinker with a PC for days on end and not actually get any useful work done.

With this in mind, there have been several attempts to put together a set of utility programs which will let the PC user configure and optimise their machine easily, so that they can get the most out of it.

PC Tools is one such suite, and it is the most comprehensive on the market – simply listing its features would easily fill the rest of this review. Suffice it to say that just about every hard disk based operation you can imagine can be done with *PC Tools*.

SHELLING OUT

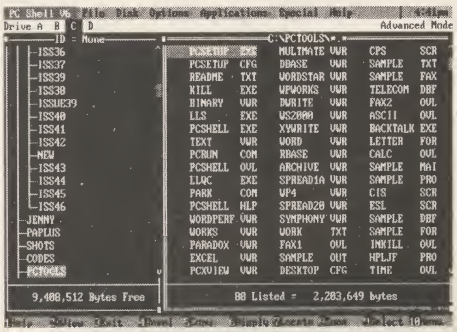
The central part of *PC Tools* is the DOS Shell. This is a program which avoids the user ever having to come across the DOS `C:/>` prompt. The screen displays a list of the directories on the disk and the files they contain. As you might expect, files can be copied, deleted and moved just by pointing at them and selecting the appropriate option from a menu. *PC Tools* is menu based, and can be navigated either with a mouse or the keyboard; function key shortcuts are available for those who find an intuitive interface is too easy.

As well as the usual file manipulation commands, files can be viewed directly from the Shell. *PC Tools* automatically converts most file formats into one you can read, including *WordStar* and *1-2-3* files and compressed *PKZip* archives. Even graphics can be viewed.

A Locate option lets you find any file on the hard disk, and you can search for the contents of a file, not just its name. Once you have found the file you want, you can launch the relevant application and load the file with a single keystroke, à la Macintosh.

Those who like a tidy disk can move whole directories with ease, and even sort the entries into whatever order they prefer.

A user-definable applications menu allows you to run any program you like without having to find it on the disk. The Shell can be configured like this by an experienced operator so that those less familiar with the machine can get to grips with it easily. To make it even easier there are three modes of operation; Beginner, Intermediate, and Advanced, with the simpler options hiding many of the more technical menu options from the user.



• ***PC Tools' Shell gives you complete contol over the PC, and can be customised to suit the individual.***

DESKTOP DESIGN

To complement the Shell, *PC Tools* offers a set of accessories combined together into the Desktop.

The Notepad is quite powerful enough to serve as a reasonable word processor – it even offers a spelling checker.

There is a *dBase*-compatible database with mail merge facilities, an appointments scheduler, comms software with fax support, and a set of calculators with financial and scientific functions.

You can cut and paste data between all these applications, but the best feature is that the whole lot will stay memory resident so you can call them up with a hot key at any time. The memory overhead for doing this is surprisingly low – only 40K or so of RAM is used. Another 10K will keep the Shell in memory too.

BACKING UP

No one who has ever backed up a hard disk using MS-DOS's `BACKUP` command will volunteer for the task again, it is slow, clumsy and awkward. *PC Tools* offers a special program which minimises the time involved.

The backup program, which is menu based, allows you to pick which files you want to back up by directory, date, file extension or just by selecting them with the mouse. It then gives you the option of compressing the files to save disk space and uses fast DMA access to speed up the backup. DMA (direct memory access) allows the program to read the hard disk and write to the floppy at the same time.

The backup program is very secure. I have had a lot of problems with backups using commercial software, which I eventually tracked down to a clash with Quarterdeck's *QEMM 386* memory manager. *PC Tools* tested my system and found it could not use the fastest backup methods; other software I have used did not detect the clash and merrily lost months of data files.

PC Tools takes around ten minutes to back up my 30Mb hard disk.

IN CASE OF DISASTER

Perhaps *PC Tools*' biggest strength is its disk data recovery option. It can undelete files, find lost directories, revitalise old floppies and even unformat disks! The whole process is automated and, although you are kept informed of corrupted FATs and lost clusters, you don't need to know anything technical to recover vital data.

CONCLUSION

Since installing the review copy of *PC Tools* onto my PC, it has easily been the most used, and most useful, piece of software on the machine. I would not be without it, and find it easier to use than other similar packages such as *Norton Utilities*.

A PC without *PC Tools* is simply not running as efficiently as it could. ■

PC Tools Deluxe *6 is published by Central Point Software and is available for £91 from Software Paradise on (0222) 887521.*

TOP PERFORMANCE

PC Tools includes a couple of programs designed to improve the performance of your PC.

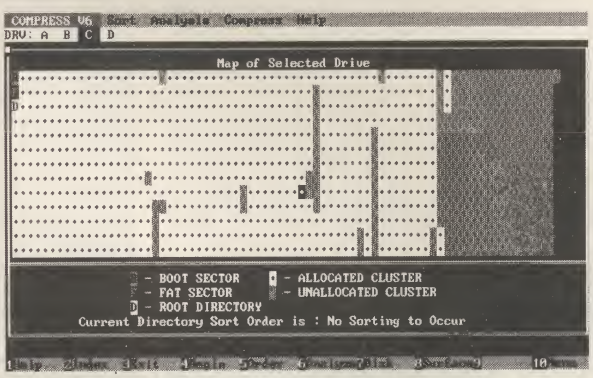
PC Cache is a RAM disk cache which keeps the most recently accessed data from you hard drive in much faster RAM. It also tries to anticipate which files you will need and reads them into RAM in preparation.

PC Cache is far from unique, but it does offer a degree of flexibility in its configuration that rival programs do not. PC Cache increased the Norton disk performance index of my PC from 1.7 to 6.4 (where an XT is 1).

More significant is *Compress*, a disk optimiser. *Compress* rearranges your hard drive, putting the commonly accessed programs together, unfragmenting large files, and shuffling files around to give the maximum amount of contiguous free space.

The most immediately noticeable effect of *Compress* is that a previously rattly hard drive becomes virtually silent as the heads no longer have to career over the disk looking for widely separated segments of file. Large programs such as *PageMaker* also load noticeably faster.

It is probably worth the cost buying *PC Tools* just for *Compress* on its own.


COMPRESS V6
Sort Analysis Compress Help
DRV: A B C D
Map of Selected Drive
- BOOT SECTOR
- FAT SECTOR
- ROOT DIRECTORY
- ALLOCATED CLUSTER
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• ***One Future Publishing hard disk which could do with optimising.***

GOING ON LINE

Your computer is sitting there just waiting to talk to the world. Keith Pomfret explains what you need to get chatting to other machines around the globe...

Going on line is the art of attaching your computer to the phone system and communicating with the outside world.

That can mean simply connecting to another computer to swap files, say at the office. Alternatively you can send electronic mail via an on-line mailbox system such as Telecom Gold or Cix. Or you can access one of the many information services such as Prestel or CompuServe, which provide access to huge databases – CompuServe has a complete on-line encyclopaedia – and even teleshopping facilities. Or you can join one of the hundreds of hobbyist bulletin boards, where you can leave messages in chatlines and download public domain software.

Comms is one of the most fascinating parts of computing, as any enthusiast will tell you. There is a lot of stuff out there to be discovered, and that's what it is about – exploring the telecommunications network.

The first thing that you'll need to know is what equipment you need, but listen to two comms enthusiasts talking and they may as well be speaking Lithuanian with their Hayes protocols, V22bis, AT codes and the rest.

VITAL PARTS

The first requirement is a modem – that's the device which translates digital data into sounds that can be sent down a phone line, and turns incoming sound signals back into computer data.

Modems differ in the speed at which they can send data down the phone line; it makes sense to have the fastest modem that you can afford to cut your phone bills to the bone.

The speed is measured as baud – effectively bits per second. Common speeds are 300, 1,200 and 2,400 baud. As the combinations of transmit and receive rates are complex they are often abbreviated to 'V' numbers – see the box for details of what they mean. V21, V22, V23, and V22 bis are the most common modem speeds, and the majority of on-line systems in the UK work with one or more of them.

There are other faster modem speeds than these, and nowadays a transmit/receive rate of 9,600 bits per second is possible, but the equipment needed to operate at these speeds is beyond all but the rich and the corporate. A modem that can use these superfast speeds could easily cost £1,200.

Some modems are manual, which means that you have to do the dialing and press a button when you hear the other system answer the phone. Other, more expensive, models are intelligent or automatic modems. These take over the dialling and automatically put you on line. The more intelligent modems will, in combination with software on the computer, answer the phone and 'take a message'. These are the modems that are on the other end of the line when you dial up a bulletin board. A cheap manual modem could cost less than £100, while a good, automatic, reasonably fast (2,400 baud), intelligent modem would set you back upwards of £300.

V SIGNS

V21, V22, V23, and V22bis are modem speed codes.

Transmission speeds are generally written down as the baud rate, with baud more or less meaning bits per second. The bigger the number, the faster the transmission and the quicker the receipt of data by your micro.

V21 is 300 baud transmit and receive.
V22 is 1,200 baud transmit and receive.
V23 is 1,200 baud receive, 75 baud send.
V22bis is 2,400 baud transmit and receive.

When buying a modem look for 'Hayes compatibility'. The 'Hayes set' is a series of commands with which your micro controls the modem. If your modem uses the Hayes set then most software will work instantly with it; other systems may well require a lengthy setting up procedure. The name originates from the Hayes modem company who invented it.

The recent trend toward laptops and cell phones has made the portable battery-powered modem available, and it is now perfectly possible to go on-line from the fast lane of the M1, the cross-Channel ferry or even the delayed 15.31 from Bristol Temple Meads.

WIRING IT UP

Having bought your modem, you'll need to attach it to your computer. This is done via the serial port.

Amigas and STs have a built in serial port, as do most PCs. The PC also offers the option of a modem card which slots into the machine directly, so avoiding using up a serial port.

If you own a CPC, Spectrum, PCW, Archimedes, certain sorts of PC, or an Atari 8-bit you will need to buy a serial port, for around £30. The dealer that you bought your computer from should be able to steer you towards one, or check the ads in Shopping Express. Exactly what fitting a serial port involves depends on the machine, but all these machines can be used to go on line with a bit of effort.

As is so often the way, there is not one standard type of socket for a serial port, so the variety of cables and connectors is large. If your supplier doesn't have one in stock he can probably make one up for you. This can cost anything from a couple of pounds for a 'standard' 25-way D to 25-way D, to about £40 to have a special made up for something like the Macintosh which has a unique serial port connection.

WHAT DO I NEED?

You need the following things:

- **A computer with serial port**
- **A modem to change the digital signal from the serial port into the nasty banshee wail that Telecom's phone lines can handle.**
- **Communications software to access viewdata or scrolling systems.**
- **A telephone line with the standard Telecom socket to plug the modem into.**
- **Copious quantities of disposable income.**

SOFT STUFF

With a serial port and modem, all that's left to find is a piece of software to make it all work. For anyone reeling from the cost of a modem, software that doesn't break the bank is a welcome option.

Non-commercial public domain and shareware comms software is available for all the popular micros. The public domain ones are free and can generally be obtained from a PD library for the price of a disk and a small copying fee. Shareware is slightly different. You can get it in a similar way to PD and try it out, but if you like it and carry on using it, you are expected to send a fee to the copyright holder (whoever programmed it) and in return you get updates and documentation. It is possible to avoid paying for shareware, but this is frowned on as it dissuades programmers from making their work available.

PD software and shareware libraries advertise frequently in Shopping Express and, as many of them are run with enthusiasm as well as profit in mind, they are an invaluable source of information as well as software.

Software varies a lot in the features it offers and the interface it uses. Features to look for are teletext support (so it can display the Ceefax-style pages which some systems use) and a good telephone book. Many comms programs will let you store the phone numbers of the bulletin boards you frequently use in a phone list, and will dial the number with a single keystroke. Others even let you program-in all the logging on commands and passwords so the whole comms procedure can be automated.

The interface question is a matter of taste, but many find pull-down menus and icons easier to negotiate than function keys and typed commands.

GOING ON LINE

With your software installed and your modem connected, you are ready to dial up a bulletin board or on-line system.

In order to make the connection you will of course need the phone number of the system, but you also need to know the communications protocol. Your software will give you options for baud rates, data bits, stop bits and parity – you don't need to know what all these things mean, but you do need to make sure the settings in your software match those of the system you are trying to connect to.

A typical host system might describe itself as V21, V22, V23, V22bis, 8N1. As we explained earlier, the V numbers mean that it will accept calls at transmit and receive speeds of 300/300, 1,200/75, 1,200/1,200 and 2,400/2,400. The '8N1' on the end means that the data

is sent, with *8* data bits, *no* parity and *1* stop bit. Set these parameters into your software before you start dialling out.

If you don't know the protocols of a system that you are trying to access, try 8N1 and 7even2 (7 data bits, even parity, 2 stop bits) as these account for over 90 per cent of systems.

If you are given options for the speed, always pick the fastest that your system can handle to cut the phone bills.

WHEN YOU GET THERE

Having set the protocols, dial up the system's number. Depending on which type of system you are accessing, when you connect you should get one of two things.

If you access what is known as a viewdata system, your screen will be formatted in coloured blocks and text very similar to the teletext service. From on-screen choices, different screens can be accessed, and you can move from area to area by typing in numbers to change screens or following on screen prompts, just like Ceefax.

The other sort of system is described as 'scrolling'. Here the screen is set out in text, usually about 80 columns wide, and it looks like a document in a word processor scrolling past.

Assuming that it's your first time on a system, you will have to register in some way. Some of the commercial systems take your details (and money) and give you logging on details prior to your going on line. Most systems will allow you to join on line by prompting you for your name and a password. If it's your first time on, the system won't recognise your name and will take you through various questions designed to help the system's manager (the 'sysop') check you out before allowing you access to the system.

Some kindly sysops will let you get away with using CB-style 'handles' instead of real names, but abuse of on-line systems is making this rarer. At the end of the day, does it really matter that a pipefitter from Oswaldtwistle called Eric Blenkinsop prefers to be known as The Flying Turbine? Probably not, but I wouldn't go around with a guy who thought he was part of a jet engine, would you?

When you eventually get through into the system, most allow you to type in a single letter abbreviation for the service that you require. It might be C for 'call' or P for 'page the sysop' if you wanted an on-line chat, or M for 'mail' or U for 'utilities' or suchlike. Typing a question mark at the main menu should get you a list of choices to follow.

Remember that as soon as the host system answers, you're paying for the phone call as if you were talking. It is better and cheaper to scratch your head off line while you try to work the problem out than to pull your hair out with Telecom dragging you into bankruptcy.

Here are a few bulletin boards to log on to and dip your toe in the water before you start on the real money grabbers, the commercial on-line services: West Coast BBS (0752 670784, 1900-0600 daily V21, V23, 8N1); Bath BBS (0225 835841, 24 hrs, V21, V22, V23, V22bis, 8N1); The Loft BBS (0442 230461, V21, V23, 8N1); and the Gnome At Home (081-888 8894, V23, viewdata).

HAVE FUN

So, you've bought the kit, plugged it in and gone on line. Be warned, now is the time to start saving for your new improved phone bill. Comms is so addictive the chances are thet you'll be getting a nasty shock when that arrives, but at least you'll have some new-found knowledge to show for it.

Enjoy, don't panic, and come back next week for a full walk-through description of a bulletin board and some of the ways you can save money by setting up your own host system and letting someone else pay the phone bill. ■

SHOPPING FOR MODEMS

Pace Micro Technology does a range of intelligent modems from a V21/V23 Linnet (£150) up to a 9,600 super-fast machine at about £1,000. Pace also does PC modem cards. Phone 0274 532000.

Modem Marketing does a complete range of modems from the most basic to the most specified. Phone 0733 371388.

Amstrad does a couple of good value V21/22/23/22bis modems. One is a 'stand-alone' (£249) and the other is a card for internal fixture into a PC (£199). Phone 0279 454555.

Miracom starts its range at about £100 or so with an entry-level manual modem, and its list also includes intelligent modems. Phone 0473 233888.

Digital Matrix does the Datatronics range with a £300 V22bis model that can recognise voice data and plays music on the line while you change from data to voice! Phone 021-704 1399.

TROUBLE SHOOTING

If you find that you are stuck, can't find what you want or cannot persuade the system that you are accessing to react in the way that you wish, there is a simple checklist.

• ARE YOU ON LINE? The flashing lights on the modem should tell you that that – check your modem's instructions to see what indication it gives of being connected to a host system.

• WHAT IS ON THE SCREEN? Is it readable or is it garbage? If there's something that you can read or make sense of, it's probably worth continuing. If there's nothing on the screen at all, try tapping the Escape or Return key a few times. Some host systems need this to wake them up. Wait a few seconds and if there's still nothing, log off (see below). If there's nothing but garbage on the screen, log off and check that you have the correct baud rate and protocols for the system that you are trying to access.

Remember that viewdata and scrolling host systems work in different ways and need different software or software configured for both systems.

• LOGGING OFF If there is no chance of dialogue with the host system, log off in one the following ways. If your modem is manual, either following the disconnect or reset instructions in the manual will 'drop' the signal and disconnect. If you use an 'intelligent' modem of the sort that supports the Hayes protocols, type three '+' signs in quick succession. You should see a reply on the screen saying 'OK'. Then type 'ATH' (the Hayes code for hang up) and the software should clear your line.

• GETTING HELP If you are on line and having difficulty, get the system to help you. The simplest way is to type a question mark. Most bulletin boards respond to this with a list of options. Choose the option that best suits your requirements and type in what it suggests.

TECH TIPS

Does your PC keep packing up? Is your Amiga less than friendly? Would your ST try the patience of a saint? Write to Uncle Tech Tip and he'll soon see you right. Send your sorry stories to Uncle TT, Beauford Place, 30 Monmouth Street, Bath BA1 2AP. There's a prize for the most pitiful tale.

TIP Printer buffer

Regarding the question put to you in Tech Tips (*Express* 70) by Andy Beveridge of Fleet, Hants. One of his questions was whether or not he could use his Commodore 64 as a printer buffer for his Commodore Amiga. Well in an old issue of *Zzap!* there is an advertisement from Trilogic which includes such a system. It consists of hardware and software to link the Amiga to the CBM64 so the latter can be used as a printer buffer. The advert has not appeared for some time but Trilogic's address is Unit 1, 253 New Works Road, Bradford BD12 0QP. I suggest that Mr Beveridge writes to them and asks if they still produce this item. I hope this information will be of some help.
A. Wright, Thorplands, Northampton.

HELP! Which computer?

I'm at the moment thinking of upgrading but I don't know what computer to upgrade to. The present computer I have is a Spectrum Plus (don't laugh). I would be able to pay up to £200.

I would need this new computer for gaming and it would also have to have a quite good BASIC language because I am a keen programmer. It should also have good enough graphics to make Atari ST and Commodore Amiga owners jump. Good sound would be appreciated as well.
Harjinder Somel, Kettering, Northants.

And with one wave of his magic wand, Uncle TT produces the ultimate cheap machine? Harjinder, your letter reads as though I was about to create your desired machine from parts I have lying around at home – not that simple I'm afraid.

£200? You already have a Spectrum Plus and you want a machine with decent graphics, sound and BASIC? Buy the SAM Coupé.

Now that it's finally here in reasonable numbers, the SAM is definitely a computer that deserves serious consideration (especially for one-time-owners of Clive's baby who will probably have a lot of Spectrum software lying around). The SAM is Spectrum compatible (to a degree), has good graphics and sound capabilities and can be had for well under £200.

It's expandable – drives and the like can be bought at any time and simply plugged in – and a machine of quality construction which Miles Davis Associates (the machine's manufacturer) took a long time to bring to market, ironing out bugs in the process.

HELP! All at C

I wish to learn C. My priority is learning the language and not speed of programming and I need a version of C that will give me instant feedback on any errors. Therefore a C interpreter would suit my purposes, but there seems to be a lack of choice in the advertisements. I have noticed however that HiSoft markets a C interpreter. Would this program suit my needs? If not, what do you suggest? Also, are there any tutorials that are suitable for the beginner to the language, available for use on the Atari 520STE that you could recommend?

I have recently purchased a copy of Ian Sinclair's *Simple C: A Beginner's Guide*. Excellent though it is, it is after all only a beginner's guide. Please do not suggest Warwick Grigg's course in *ST Format*, for it is entirely unsuitable for the absolute beginner to C.

Another quick question. Do you know why Atari supplies its ST BASIC with a disk at revision D but a sourcebook/tutorial at revision B? I could not get a satisfactory answer from Atari – the company says that's all there is!
I Bateson, Hanworth, Middlesex.

Hang on! You don't want to follow Grigg. W's tutorial in *ST Format* because it's not possible for the complete amateur to keep up with the action, yet you're scathing about Ian Sinclair's C guide because it's intended for the rank amateur! Tell me I Bateson, what do you want?

A book which I used extensively while at University was *The Big Red Book Of C* published by the Sigma Press and available for under a tenner from most good High Street book stores. This guide assumes no prior knowledge on the part of the reader, yet leads you into fairly extensive programming quite quickly. Ludicrously cheap at the price, it's well worth a look.

HiSoft is a respected producer of language compilers and its C interpreter is no exception. If you're looking for a C interpreter then look no further than the HiSoft offering.

And as for your final question, I'm afraid the honest answer is that I have no idea why Atari supplies a sourcebook/tutorial for revision B of its ST BASIC, but a disk for its revision D. But then if Atari was being honest, it'd probably say the same thing...

HELP! Quality print

I have an Atari ST and I use the excellent Degas painting package and *1st Word* word processor. What I would like to know is, does any company offer a service to print *1st Word* files and documents containing text and graphics with a laser and is there anyone who can produce photographs from Degas files? I would appreciate any help you can give me.
Angus Irons, Selly Oak, Birmingham.

I do seem to remember seeing an ad in the classifieds offering a laser printing service for a reasonable rate but can't for the life of me, find the ad – and so can't give you the address or telephone number I'm afraid.

As for photographs, why not produce your own? This is not quite as difficult as it sounds and with a modicum of care, quite respectable results can be obtained. Want to know how? Read on...

You'll need a single lens reflex (SLR) camera, a tripod, cable shutter release and a roll of fast colour film (ASA 400). Bung the film in the camera, the camera on the tripod and the cable release in the shutter button. Open the lens as wide as possible (usually about f1.7 on most reasonable quality cameras) and set a shutter speed of 1/4. Darken the room as much as possible and stand the tripod in front of your monitor or TV so that the lens is positioned as squarely as possible relative to the screen. Now get you Degas picture on screen, take up the cable release, hold your breath and fire the camera. Move the speed setting to 1/8 and repeat the process, then again at 1/15. Eventually, you'll have three exposures of every screen you wish to photograph. Send the film off for processing and when it returns, select the best exposure of the three for each screen. Simple, right?

HELP! Menage à trois

Every week I read your column with interest *and very good it is too! (Flattery will get you absolutely everywhere – Uncle TT).* I was wondering if you could help me with a little problem *(your tongue's stuck to my boots, right? – Unc).* I have an Amiga A500, an Olivetti M10 portable and a Sharp IQ7000 organiser. The M10 has communications software built in and I have *Access!* for the Amiga. If I want to connect them together, do I just get a null modem cable connected to both RS232 ports, set both to a baud rate of the same value (as well as all the other settings) and start, or is it more complex than that?

Now for the question of the year. I have *Transformer* for my Amiga. If I purchase the level converter with the software which is meant for the PC, will it work under *Transformer* so I can save all the IQ's information on disk?

Last but not least, I am purchasing an Amstrad DMP4000, and I have a printer cables for both the Amiga and Olivetti. Will I have to change any settings on the printer when using the Olivetti or does it output Epson codes? I do hope you can help with these problems and keep up the excellent work with the column.
G Harris, Bognor Regis, West Sussex.

Connecting the Sharp IQ7000 and Commodore Amiga should entail no more than connecting a cable between their respective RS232 ports, setting the comms software as you say and starting the process.

As for the level converter and *Transformer,* I would be very surprised if the two would work happily together. *Transformer* uses lots of little software 'cheats' in order to do its stuff and these tend to get in the way of any software not completely 'legal'.

To use the Amstrad DMP4000 effectively with the Olivetti, you'll need to set the printer into IBM mode. It will then be able to interpret the codes output from the Olivetti. This setting is usually effected using a dip switch in a completely inaccessible place on the printer – but there you are, that the fun you get with two incompatible computers using the same printer.

HELP! Overloaded PSU

I own a Commodore Amiga with a MAST twin external floppy disk drive attached. The company I purchased it from warned me that bad picture quality might result from running three disk drives on the Amiga's own power supply.

Since then, I have read that the Amiga's power supply unit will be overworked and could be damaged if I use two external floppy disk drives without their own power supplies. One magazine said "...the A500's power supply will not cope with more than one unpowered external drive".

I have had my twin drive for over a year now and have experienced no picture interference or other problems, even when all three drives are being accessed simultaneously.

Am I damaging my Amiga by not using an external power source when I run the drive?
Daniel Talkington, Reading, Berkshire.

Apparently not! One cannot argue with experience and in your experience the Amiga appears to be perfectly OK, even with all three drives whirring away at once. I think that in the interests of the machine, it's probably advisable not to use more than one unpowered external floppy drive with the Amiga, but if your system is fine, then carry on.

HELP! One in a million?

Being a fairly honest sort of chap, I am interested in the principles of shareware. I have obtained a program from a PD library which originated in Canada. As the documentation is limited, I would like to send the author the suggested amount of $20.

Could you please tell me the best and safest way to do this as cash through the post is obviously not on.
Simon Hiscocks, Penarth, South Glamorgan.

The normal method is to send an International Money Order available from banks and post offices. These cost a pound or two but are generally regarded as being the safest way to send money abroad.

What you haven't taken into account however, is that although you want to do the decent thing and send the moolah to the author, many programmers in the States and Canada don't always bother to send the promised documentation, program updates and so on outside the continental USA. A drag, right? But that's the way it goes I'm afraid. It's apparently too expensive and difficult to put the necessary in the mail to the UK from America and Canada.

HELP! Clocked out!

I have had some trouble with my Commodore Amiga recently and was wondering if you could help? The system clock seems to have stopped. I set the time from the battery-backed clock using the SETCLOCK load command and the time is set correctly, but it stays at the same time until I repeat the process.

I cannot understand this because some games which use the timer seem to work all right. I know it is not a virus as I have tried several disks which I know to be virus free and have tried my own workbench disk on another machine.

I rang a local dealer who said that it would cost £100 to repair. I don't think it's worth spending that amount of money on such a minor fault as apart from this my machine (which is three years old) works perfectly well.
Adrian Fox, Chesterfield, Derbyshire.

Seems to me that your battery-backed clock is no longer battery backed! £100 to repair indeed! Take the machine along to a reputable dealer and have the battery changed. I think you'll find that's all that is needed to get you on time again...

HELP! Little Acorns

I have two problems on which I hope you can give me some assistance. Firstly, I have purchased a second hand Acorn JP101 inkjet printer and, as seems the norm, the previous owner had lost the manual. The printer works fine with my CPC464 but is permanently in draft mode. Is the printer capable of better print and if so, do you know the relevant codes? I have contacted Acorn who suggested a possible source for a manual but unfortunately, the supplier had no knowledge of this machine. The printer uses Olivetti ink jets and could well be one of theirs with an Acorn badge. Would the print quality be improved by using ink jet rather than standard paper?

Secondly, I have also purchased an Atari 1050 disk drive which I would like to connect to my CPC464 as a second drive.

If this is possible, could you please advise me of a supplier for a cable or the relevant connectors and connections?
Neil Barret, Leeds.

I'm afraid I don't know the control codes to get your Acorn-badged inkjet printer into near letter quality mode (if indeed the device provides such a mode) and can only print a plea for Techtippers who have now, or have ever previously owned, a printer of the same specification, to send in an unwanted manual which I will gladly pass on to you.

Using paper especially intended for inkjet printers may help with the quality of reproduction but I doubt it. Stick to ordinary paper and save yourself the expense.

As for the Atari disk drive, I hope you didn't pay too much for it, because it simply cannot be used with the Amstrad CPC464 – at least not without major surgery and even then it'd be doubtful. Bung an ad into Shopping Express or contact Edmund Blake, author of the *Express* Atari 8-bit column who may have a suggestion. ■

HELP! Can I attach any old printer to my Commodore 64?

Is it possible to wire up just about any printer to work on a Commodore 64 or would you need special software for each different make? I've seen so many cheap printers and plotters advertised in magazines lately and wondered if it would be possible to rewire them. For instance, a Sharp printer/plotter which was intended to be used with a Sharp computer.

Also, please could you explain the difference between Centronics, parallel and RS232 interfaces?
P Hodgson, Maryport, Cumbria.

• Best selling printers from panasonic and Citizen which need an interface to connect to a C64.

It is not possible to 'rewire' printers to work with the Commodore 64, but it is possible to buy a printer interface for this computer so that it can make use of standard printers. Like so many other early 1980s computer manufacturers Commodore equipped their 8-bit machine with completely non-standard interfaces to lock users into buying Commodore's own peripheral equipment (usually at grossly inflated prices).

With an interface, you'll be able to buy any of the standard printers such as those marketed by Panasonic, Star and Citizen (the most popular makes at the moment) and attach them directly to the CBM64 without problems. These interfaces are available from a variety of advertisers in Shopping Express, so have a good rummage and see what you can come up with.

And so to the interfaces themselves. Centronics and parallel are – almost – one and the same thing, in that the Centronics interface is parallel. The signals emitted from the interface are transmitted in unison. Centronics is a brand name for a type of parallel connector. RS232 on the other hand, emits signals one after another. For printers, parallel is used almost exclusively – it's fast and simple. RS232 used to be used extensively for printing, but now is restricted almost exclusively to communications.

EXPRESS MAIL

Britain's liveliest computing forum – packed with comment, controversy and conflict. Write and tell us what you think! Reach us at: *Express Mail, 30 Monmouth St., Bath BA1 2AP* Sorry, no personal replies, even with an sae. This week's replies written by Keith Pomfret.

Play us a game, SAM

The SAM Coupé has been around for nearly five months now, and still suffers severely from a lack of software. The Spectrum compatibility is not as big an advantage as was at first thought. Only a small proportion of Spectrum games actually work on the SAM, and even when you load the Spectrum ROM into the SAM you have big troubles trying to get it to pick up the sound.

The Coupé's release was considerably delayed. When people actually got their SAMs they had a long wait for the DOS. MGT has promised to produce a mouse but it still isn't on sale. With software, there are a number of companies promising to release games but they still haven't come out. It seems that the smaller companies are taking the lead – LERM has released an assembler and *SAMTape* 1 and PCG has released a DTP.

Some of our subscribers have written letters saying they are very worried about this situation. They think it might be another Enterprise, C16 or Memotech.

A computer is not alive unless it has a good supply of software releases. That's what is desperately needed, so – calling all software houses! There is a good untapped market out there and if you release some good games on the SAM you could make a killing (and loads of money).
Adrian Bett, Editor, Turbo.

More criticisms of Messrs Miles and Gordon. We have contacted MGT and arranged to put to them all the praise, criticism and questions about the Coupé soon. Watch *Express* for more details.

Seeing the fungicide

I feel I must write in defence of myself. I am referring to the letter in *Express* 80 from Michael Flanz.

I wasn't the only person to use the name 'A. Programmer' but I was the first; my name is actually Fungus the Bogeyman, but I didn't think anybody would believe me.
Fungus the Bogeyman

Unfortunately, readers, he's telling the truth about his name...

Rather rude

First, thank you for printing my reply in *Express* 79, I was glad to be allowed the opportunity of doing so.

Secondly, in reply to the rather rude Michael Stirling (*Express* 79): if you don't have the mentality of a 14-year-old schoolboy, why does your letter have the distinctive 'so there' ring to it?

Allow me to put *you* in *your* place; you have misunderstood me. Of course the icon bar automatically scrolls itself. *!TinyDirs* has nothing to do with this operation, but the reason for loading it is that it is an easy way to fill up the icon bar to demonstrate the scrolling. OK?

I didn't agree with Keith's reply, but he's entitled to his opinion.

By the way, I'm a 15-year-old schoolboy. Now you weren't expecting that!
Chris Eason, Leamington Spa, Warks.

This slanging match is now closed.

PCWs rule okay!

Is there any truth in the rumour of a 'new' PCW? Namely the PCW2024, with 20Mb hard disk alongside the 3-inch disk, plus 24-pin dot-matrix printer. It would have all the *LocoScript* programs plus a new one, *LocoTool*, a toolkit for converting PC disks and a data recovery program. Am I being too hopeful?

Jokes aside, could I ask you to include a few games profiles for the PCW? All the games featured in your mag are for Amiga, ST, Sinclair and PCs.

I admit the screenshots would not look very good, but it would prove to the 'mine's better than yours' brigade that the PCW *does* have a games capability.

On the 'mine's better than yours' front (no I won't say that mine is), have you noticed that all the adverts for penfriends come from Amiga owners?

Does this mean that their computer leaves them feeling so lonely that they need to find friends? Or are they just spending so much time trying to get their computer to work that they haven't time to walk out their front door and find friends that way?

Sorry, I had meant this to be a short, jokey letter. Now look at me rambling ➤

Hiding the facts about those Amiga hard drives

Regarding the article "Learning to drive" in *Express* 78, the price of Commodore's A590 is quoted at £574, which I am sure succeeded in completely putting off anybody hoping to buy this drive.

I bought my A590 in November and it makes one hell of a difference to the Amiga system. OK, maybe the access time isn't exactly greased lightning, but with all the Amiga C commands, libraries, devices etc available on one unit, I have never figured out how I did without it. To a non hard disk user this may sound a bit overdone, but I can assure you the difference is overwhelming. PC users used to snigger behind Amiga users' backs when they looked at the prices of Amiga hard disks, and now that prices have become more or less reasonable I don't want to give them the pleasure.

On top of the hard disk I managed to expand my 1Mb system to 2Mb for only £78 using the built-in board, which isn't at all bad. On the Tech Tips page of the same issue the author pointed out that 1Mb is "useful for really big word processed documents and scrummy picture files". Why doesn't somebody remind him that the Amiga is a multi-tasking system? I don't write particularly long documents or draw scrummy pictures but I quite frequently use up my 2Mb with pure multi-tasking. The author made the Amiga sound like an 8-bit (heaven forbid).

Paul Gardener from Maidstone had some trouble with an LC-10C, I have the mono version and have also been having trouble with printer drivers. Some Epson drivers print pound signs instead of hashes, and the ones which print them as hashes don't print proper graphics. I have been recommended to try the Epson FX driver for mine, but it's only mono. LC-10 owners can also try putting the printer into IBM mode and using the CBM MPS1000 driver for interesting type faces.

As regarding escape codes, the LPRINT command will use the Amiga control codes (described in the Amiga manual) whereas the following line:

```
OPEN "PRT:" FOR OUTPUT AS #1
```

will use the printer's control codes if you use

```
PRINT #1,[string or escape code]
```

instead of LPRINT. Remember to type `CLOSE #1` when you've finished addressing the printer, though. Another fault with LPRINT is that it doesn't close the printer device, so don't use LPRINT before PRINT #1.

Going back to hard disks, if anybody wants help setting up their Amiga hard disk I would be pleased to try. I have enough PD utilities at hand to provide quite a good front-end without too much trouble. Also remember to frequently back up hard disks, you can try using *MRBACKUP* which is PD. Contact a PD library or me if you want a copy. I should just stress that I am not a company, just a fairly experienced Amiga user who would be pleased to help anybody. And no, I'm not interested in buying pirated games. Any correspondence will be gratefully received. Write to me.
David French, Gateacre, Devon Road, Salcombe, Devon TQ8 8HQ

What good would hiding the price and the access time of a hard drive from our readers do? The Commodore A590 is expensive and slow. It may speed things up a lot by Amiga standards but is still a snail by comparison with a good PC hard drive. The article you mention was a general round up of many machines and not just an Amiga-plugging forum.

Thanks for your tips on printing and hard disk back-up. There would be less tears if people realised that hard drives like all media aren't immune to failure, and, because of their size, failures are usually catastrophic.

I'm sure Amiga owners will probably be grateful of a knowledgeable contact for help in setting up a hard drive.

THE ATARI ABC

Now, there's a PC-AT compatible that not only solves problems like other AT compatibles, it also solves the one problem that its predecessors have created ... affordability.

Silica Systems are pleased to present the new Atari ABC. The ABC is a 286 AT compatible that runs at over 5 times the performance of the IBM XT. This is achieved by combining the power and speed of a 16-bit 286 processor, with Atari Corp's development experience and engineering capabilities, which use the very latest in design technology. However, the Atari ABC's are available at 'XT prices' and many XT owners will wonder why they paid more, but got less!

The ABC is a reliable, high performance computer, built to exceptionally rigorous standards. It is well designed, to a state of the art specification, maintaining maximum expansion capability for the future. This includes up to 4Mb of RAM and 3 AT expansion slots. Plus, unusually for a PC at this price, the ABC has the ability to install two or three extra drives, with the cabling already inside the CPU.

The ABC has a host of impressive features, all built-in as standard, encouraging simple installation and ease of use. In addition, the ABC's small footprint and quiet operating, mean that you will notice it less on your desk than other PC's. Except, of course, when you begin to take advantage of its AT power.

At its remarkably low price point, the ABC is ideally suited for home, office and educational use and will take full advantage of the vast range of PC compatible software. And, with 12 months FREE on-site maintenance (8 hour response), you can rest assured that your ABC will be fully supported.

The ABC is the latest addition to a comprehensive range of both 286 (8Mhz or 12Mhz) and 386 (16Mhz and 20Mhz) PC's, from the Business Systems Division of Atari Corp. Atari's PC range offers an unsurpassed combination of reliability, compatibility and expandability, with unique features like Atari's 44Mb removable hard disk on their PC4. Return the coupon NOW for further details of the complete range of PC products from Atari's Business Systems Division.

ABC TURBO
AVAILABLE: JUNE 90

To put the ABC even further ahead of the competition, we have introduced a special 'Turbo' version, which includes a super fast RLL hard disk controller to increase the data transfer rate from 150KBytes/s to 800KBytes/s, with a performance index of 4.801. Plus! to provide exceptional graphics with an outstanding colour resolution of up to 1024×768, we have included a Super VGA graphics adaptor and a 14" VGA colour monitor (which also supports 1024×768 resolution), all for an additional price of only £300. Check the ABC Turbo against the competition, at only £1299 (+VAT) with 30Mb hard disk, Super VGA colour graphics capabilities, plus 12 months on-site maintenance, it offers unbeatable value.

LOW PRICE - HIGH SPEC!

CPU+MOTHERBOARD
- 8Mhz 80286 16-bit CPU
- Landmark Speed = 10.3Mhz, Norton SI Test = 9.0
- Latest NEAT (New Enhanced AT) technology chip set
- Has user selectable bus, DMA speeds & wait states
- Programmable to operate at 0 or 1 wait states
- 640K RAM base memory (expandable)
- Motherboard expandable to 4Mb RAM memory
- Real time clock with battery back-up
- Full 16-bit data line capability
- Socket for 80287-8 numeric Co-Processor
- 3 16-bit AT expansion slots (max)

DISK
- 32Mb RLL hard disk - 150KBytes/s transfer - 60ms access
- Fast disk controller - 800KBytes/s transfer - *Turbo version*
- 1.44Mb built-in 3½" floppy disk drive
- Space for two 5¼" and two 3½" drives (max)

I/O
- Parallel port built-in (25-pin Centronics)
- Serial port built-in (9-pin RS-232)
- Mouse controller port built-in (9-pin serial)

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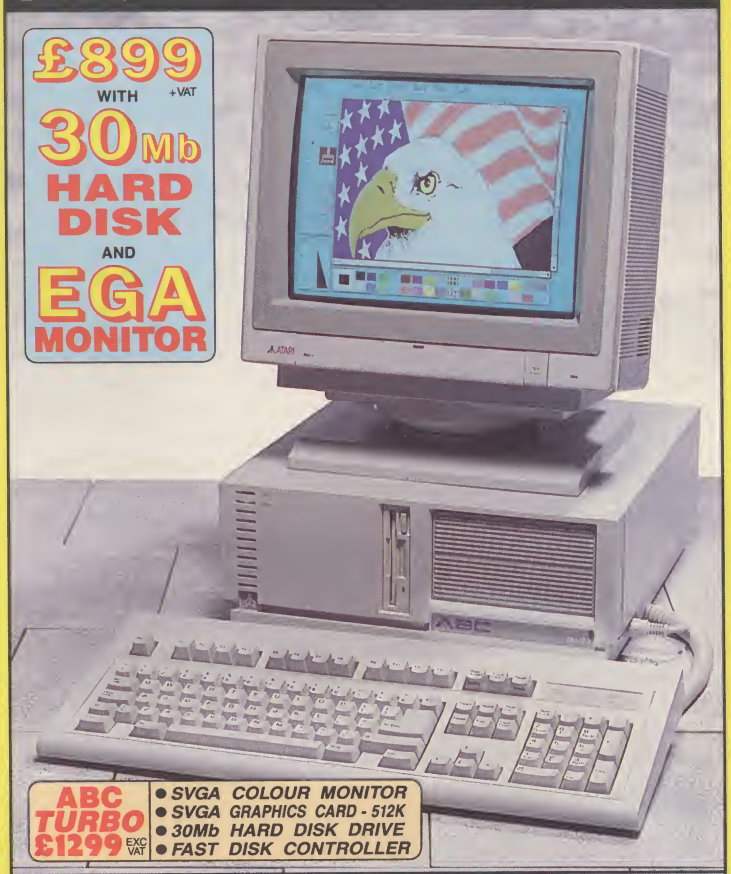

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on, showing off the ease of letter writing with a PCW, ho hum. Better stop now or you'll probably cut me off in mid
M J StClair, High Littleton, Bristol.

And I thought rambling was something reserved for those strange middle-aged men with trousers that only reach their calves. Perhaps you are one of those? The PCW rumour sounds a little far fetched, but a quick call to Amstrad revealed lips as tight as they normally are just before product launches.

We generally mention games if their publishers tell us about them. I agree that there are some fine games on the PCW, but if the people who publish them don't tell us, we won't know. PCW publishers take note.

In-house pirates

I recently bought *Manic Miner* for my Amiga (don't laugh, it's an excellent game) but became concerned when I read the credits. Tucked away in a list of names were regards for 'Bamiga sector', 'Quartex' and 'The Scouse Cracking Group'. As far as I am aware these groups are cracking and piracy groups and I would like to know how their names were allowed to get on to a commercial disk.

It seems absurd that Software Projects would condone piracy, so I can only assume that these names were put in by a programmer without Software Project's knowledge (although this is questionable too, since the programmers are the ones who lose most through piracy).

I would suggest that Software Projects removes the names from future issues of the game and tries to track down who is responsible for them. Maybe I'm over-reacting slightly, but if there is a person in the company with connections with pirates then surely it is in Software Project's best interests to find them.
S McCartney, Ayr, Scotland.

Apparently there's a new trend of poachers turning gamekeeper. Perhaps this is such a case.

Too late?

Let me begin by saying that I have been buying your publication since its birth and wish to congratulate you on the quality and variety of issues and reviews. The only reason I haven't taken out a subscription is because you are going to give me one for this sparkling bit of prose. *(Oh no we're not – Letters Ed)*

Right, that's the grovelling introduction out of the way, now for the real reason for my letter. I am one of those people who object to the 'my computer is better than yours' debate. However, in the past few days I have been the victim of the above mentioned.

For the past two years I have been using, happily, a Commodore PC10, but I wish to change computers, as I would prefer something that is capable of word processing and can turn in a respectable performance as a games machine. The Atari 520STE seems to be perfectly adequate and I think it will become the Atari standard. However, while in a computer store yesterday I was subjected to cries of "why buy a Skoda when you could have a Porsche" – obviously referring to the Amiga. What I need from you is a few comforting words to revive my battered ego.

Finally, why do people say that the STE has come too late and that everyone will program for the basic ST – this state of affairs does not exist in the PC world, perhaps the software companies ought to think about that one.
Justin Henzie, Kingston Vale, London

The simple answer to your Skoda/Porsche problem is to pick your computer shop carefully. In a computer shop in Preston the assistant spent a good 10 minutes trying to avoid telling me anything about the Amiga while extolling the virtues of his beloved ST. Pick a dealer who is enthusiastic about your chosen machine.

People say that the STE has arrived too late because of the large base of software available for the original machine that can't take advantage of the 'enhanced' features of the STE.

Your need of a good games/word processing engine will be well served by the ST. Our sister magazine *ST Format* manages quite nicely using *Protext* as a word processor on the same machines that are used for bashing aliens ■

NEXT WEEK

GETTING AROUND
Practical guide to laptop computing

BOARD STIFF
Setting up your own bulletin board

ROM STUFF
How CD-ROM is finally here in force

PLUS

Columns for your machine, all the regulars and the most up to date news service in computing

OUT THURSDAY

Win a graphic treat for your Amiga

It's Amiga graphics time in week three of our summer series of Just the Word competitions, with almost £600 worth of prizes to be won courtesy of Gem Distribution.

The first package up for grabs is Mindware International's *PageFlipper Plus F/X*, a full-screen special effects program with ANIM support. *PFX* works at all Amiga resolution levels in overscan, extra half-bright and HAM modes, and allows animations to run at up to 20-30 frames per second in high resolution, 40-60 low res.

Animations may be compiled to run in parallel, and fades, wipes, dissolves and custom transitions are all available.

Also on the menu this week is *PageRender 3D* from the same manufacturer. As you might guess, *PageRender 3D* is an image rendering program which supports stereo vision via the red/blue glasses included or Haitex X-Specs.

Four draw modes are available in any resolution, and scenes are not restricted to screen size but are limited only by available RAM.

Rotation and motion are possible, with automatic tracking, ANIM files may be generated, and the package can be used in conjunction with *PFX* to produce powerful 3D animations.

Each of these programs costs £99.99 in the shops, but three lucky readers will each win the pair of them for the price of a postage stamp by answering one simple question correctly.

Somewhere in this issue of *Express* – either in the editorial or in an advertisement – is the word OSWALDTWISTLE. All you have to do is find that word, go back to the previous sentence and write the *final* word of that sentence in the space provided on the answer form.

Fill in you name and address and send you entry to Gem Competition, *New Computer Express*, 30 Monmouth Street, Bath BA1 2AP, to arrive not later than Monday June 11.

The first three correct entries out of the hat will be the winners, and the editor's decision is final.

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